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EXCAVATING ENGINEER

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TO EXCAVATION

About Excavating Projects — By Excavating Men — For Excavating Men — The World Over

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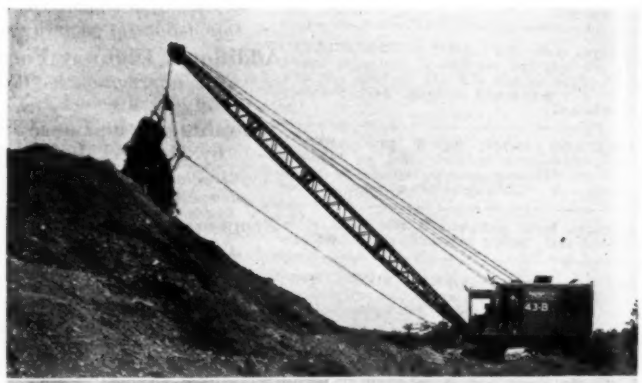

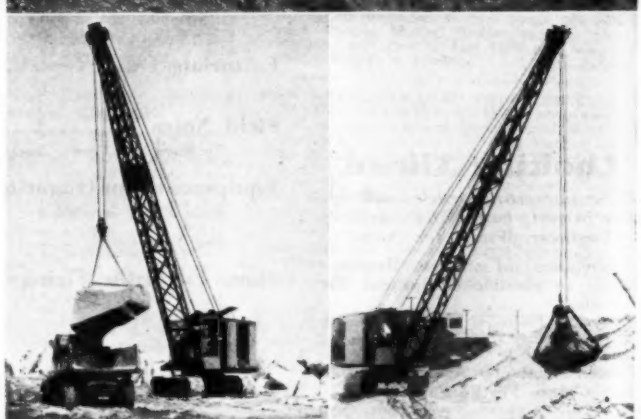

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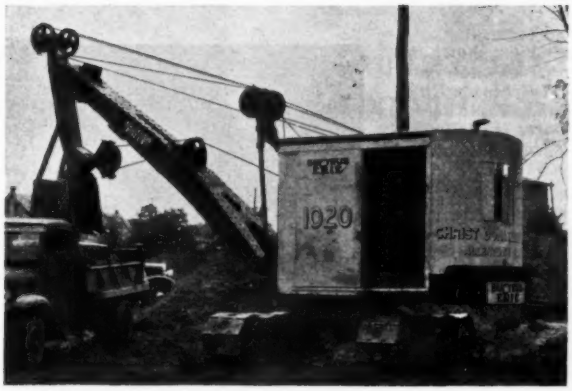

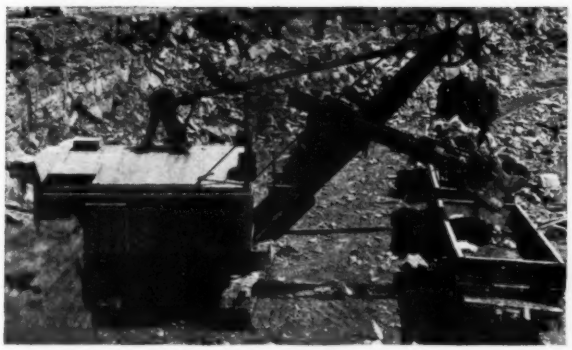

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This air view shows the North Street under-pass on the Hutchinson River Parkway. Maple Moor Golf course is easily distinguished in left center.

Below—Saw Mill River Parkway as it is today. At the left we see the old swamp north of Tompkins Avenue which has been changed into the beautiful drive shown at the right.

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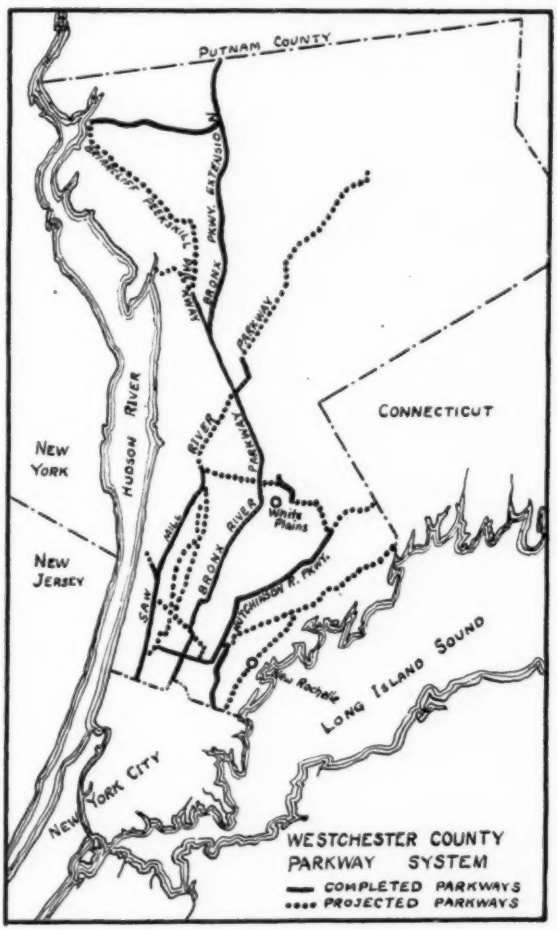
Landscaping Westchester Highways

County Commission's Construction Division uses Diesel Draglines for Extensive Fine Grading on Parkway Project.

By D. W. EVANS



Map of Westchester County, showing, in solid line, the completed 80 miles of the parkway system; and in dotted lines, the additional 80 miles to be completed as laid out under present plans.

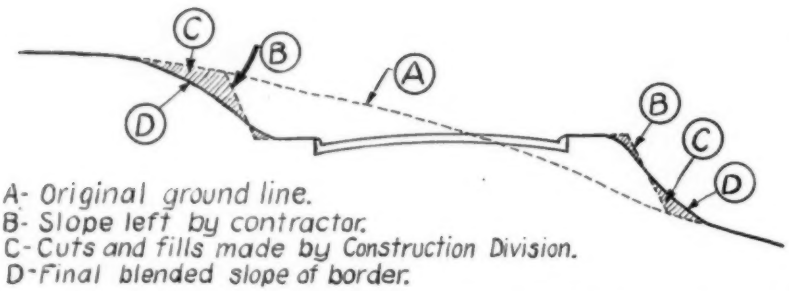
PICTURE to yourself the finest highway you ever saw. It has high speed alignment, a firm foundation, adequate paving, wide shoulders, perfect drainage, and neat slopes on cuts and fills. It is the best conception of modern highway engineers. The work of the construction forces of the Park Commission in Westchester County, New York, begins where the highway contractor leaves off. Under the intelligent direction of landscape architects, they transform the borders of trunk highways into parks of permanent beauty.

The Westchester County Park Commission is responsible for the creation of a system of parkways, recreation centers, amusement parks and bathing beaches. Progressing in accordance with a broad plan of development, the program is now more than half completed. Subgrading and paving, buildings, swimming pools, bridges and other major units of construction are done by contractors. Landscaping, finished grading, waterway improvement, minor structures, top-soiling and planting are handled on a force account basis by the Construction Forces. A notable part of this work is the extensive use of Diesel draglines for the fine grading of many acres of the parkway system. Such accurate work is done by the operators of these draglines that all that is left for the gangs laying top soil is to smooth out the teeth marks left by the bucket.

EDITOR'S NOTE: How Westchester County Park Commission changed an automobile graveyard into an athletic field was told in Excavating Engineer for August, 1930.

Make plans to solve traffic congestion

Directly adjoining New York City on the north, Westchester County is the only mainland approach to the city, and is, in addition, an important recreation center. The rapid increase in the number of automobiles during the past fifteen years created enormous traffic congestion on the two main highways from New York through the county. Leaders



Cross-section sketch illustrating the excavation done on Highway borders by the Construction Division.

were confronted with the problem of reducing this congestion by the construction of new roads. At the same time it was desirable to maintain the high class residential character of the county, and to provide adequate recreation space.

Solution of this vexing problem was started by the creation in 1922 of the "Westchester County Park Commission." This is a group of six public-spirited men, who serve without pay, appointed by the county board of supervisors.

The Bronx River Parkway, then nearing completion, served as a pattern for the ideal development of Westchester County roads. This project demonstrated the advantage of park land on either side of a highway, as it offers a buffer to keep traffic noise and nuisance away from residences. The principal waterways in the county run generally in a north and south direction, the natural course for traffic. The

There are gas stations and roadside lunch rooms along the parkways, but they are of a design approved by the Commission's architects. Here, just below the Kensico Dam, is a tavern and gas station typical of the approved type of structures.

Commission laid down a program of development in these river valleys, including: elimination of marshes and swamps; building of highways; provision of parkland; prevention of ribbon development of housing; offsetting costs by increasing real estate values, and by moderate charges for concessions and recreation facilities.

160 mile highway program planned

With this program established, and with consideration of population trends and real estate conditions, the Commission laid out a plan for improvement of the entire county. In addition to parks, playgrounds, beaches, golf courses and the like, a boulevard system involving 160 miles of road was established. More than 80 miles of this system have been completed, and all the land needed has been acquired.

Engineers, landscape architects work out plans

The collaboration of engineers, architects and landscape architects, employed by the Commission in planning and executing the parkway system, has made possible a unique combination of highways and parks. Practically all roads intersecting the boulevards are carried overhead on bridges of graceful design. The standard 40 foot width of road is laid down in a right-of-way of not less than 300 feet. These bordering parks are landscaped, and include, besides trees and shrubs, many miles of bridle paths, and numerous small lakes, artificially created. Guard rail protecting the highways is stained to harmonize with the wooded background. Lamp standards of rustic type were designed by the Parkway staff. The result of all this effort and thought is a park system unequalled anywhere in the world.

Ever since the beginning of the Commission's program, careful planning has featured every piece of construction work executed. Ordinarily two years or more elapse after the plan of some new work is begun before the project is completed. Thus while this body was first appointed in 1922, it was 1925 before any major construction program was well under way.

Major construction on contract

The policy of the Commission on construction work is to perform all work on a contract basis for which reliable estimates can be prepared at reasonable cost. This insures careful expenditure of moneys appropriated. Much of the work, however, is of such nature that the preparation of specifications on which bids could be taken would be impossible. Jobs of this nature are handled by the Construction Division under direction of Superintendent L. R. Stuffler.

Plans of the Commission, in addition to the highway system, included the landscaping of about 15,000 acres of park land. This work, together with swamp elimination and channel changes, required the Construction Division

This bridge is typical of the many beautiful structures which carry cross traffic over the main parkways. Note the finished landscaping of the slopes.

to handle excavation estimated at between 2 and 3 million yards of earth and rock. The decision was reached to purchase a substantial amount of excavating equipment, and to rent such additional machines as would be required.

Diesel draglines selected

In 1925, Superintendent Stuffler and Master Mechanic W. R. McLaughlin, made a thorough investigation of excavating machinery then available. While practically all highway excavation was done with power shovels, they concluded that a dragline was the logical tool for most of their work. They also favored Diesel power, because of the economy in fuel, and the long life of the Diesel engine. Two 1-yard Bucyrus-Erie D-2 Diesel draglines were purchased, and put on swamp elimination work and channel changes.

"Put clothes on highway"

The contractor, in completing the rough grading for one of the

county highways, is required to produce on slopes a modified railroad embankment, usually 3 to 1. As fast as the contractors finished, the Construction Division started landscaping. The character of this work varies considerably, and includes creation of artificial lakes, removal of knolls, filling in of gullies, etc. The general principle is to modify the embankment left by the contractor into a compound curve known as an "ogee," so that the slope from the edge of the pavement will blend perfectly into the background. Mr. McLaughlin describes their work as "putting the clothes on the highway."

5 Additional Diesels purchased

As the volume of work increased, additional equipment was required, and during the next five years, five additional 1-yard Bucyrus-Erie D-2 Diesel draglines were purchased. Two sets of shovel equipment were added, so that the machines would be better able to handle such rock excavation as was encountered.

In addition to the draglines, the County owns 15 5-ton dump trucks; 20 1½-ton trucks; 6 3-ton cargo trucks; 2 Universal truck cranes; 2 Byers Bearcat machines; 3 Ingersoll-Rand portable compressors; 12 portable pumps of varying sizes; and several tractors. They also have a Highway Trailer for moving the draglines from place to place. This is hauled by a 7½-ton Autocar truck fitted to operate the hydraulic brakes on the trailer. In 1931, during the heavy construction program, this outfit moved 8000 miles in placing machines at different locations.

Construction increased from 1925 at an accelerated pace, reaching a peak in 1931, during which year $4,500,000 of State and County funds were expended on parkway construction. The volume of work handled by the Construction Division was expanded to such an extent that they had to rent considerable equipment, including six power shovels and draglines, and 35 trucks.

It will be appreciated that considerable servicing and repair work is required to maintain all the County equipment in first class working order. This work is done in a completely equipped shop in the basement of the Central Stores building, a modern five-story structure located in New Rochelle. Mr. McLaughlin, who has charge of this servicing, can be proud of the condition of the machinery in his charge. The draglines, for example, are kept so clean and shining you could eat off the floor.

Complete 10,000 acres of landscaping

Because of the complex nature of the landscape grading, no record is kept of the yardage moved in the blending process. This would require the taking of profiles after the contract is finished, and again after the Construction Division has completed its work. During the past eight years, landscaping has been completed on 10,000 acres of the parkway system, and it is roughly estimated that more than a million yards of dirt has been moved in bringing the park lands to their present state of perfection. This is an impressive figure, considering that practically all this yardage was fine grading.

Diesel fuel cost only $1.28 per day

The years have vindicated the judgment of the Construction Division in purchasing Diesel draglines. Fuel oil is bought at 8 cents a gallon. The machines will average 16 gallons a day, in steady going. Only two drums of Diesel oil have ever been stolen, the thieves apparently believing it to be gasoline and not returning for more although the machines

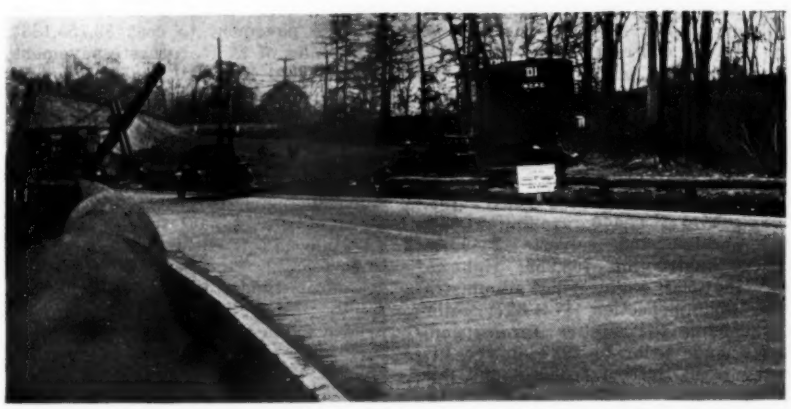
Central Stores Building in New Rochelle. Here all county-owned equipment is serviced in a completely equipped shop in the basement. The boom of one of the D-2 draglines may be made out to the rear of the building.

are often left without watchmen in isolated locations. It was three years before they had to take shims out of the connecting rod bearings on the first machines.

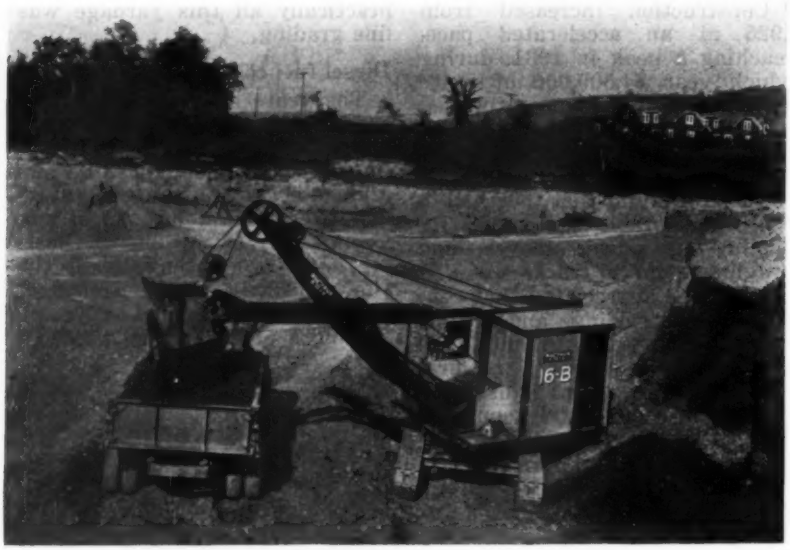
The County has developed its own group of operators for these draglines — men who can cut close to the grade established by the engineers. These men have been trained without difficulty to handle Diesels. At first they were instructed not to touch the engines but to get the mechanic to make all adjustments. Soon, as they became acquainted with the engines, they could handle them without need of the mechanic. No difficulties have been heard of now for a long time.

In landscaping, until the last couple of years, bulldozers were used to spread fill material. But starting in January, 1931, changes were made to provide additional employment, so that hand labor is now used for spreading on fills, placing top soil, and other phases of the work possible. This work is now progressing on the Briarcliff-Peekskill Parkway, under direct supervision of E. S. Strang, Asst. Supt. of Construction. Only two draglines are used, one of these being operated by George Morris, who has been with the County since 1920. This dragline, one of the pair first pur-

(Continued on Page 104)



The dragline, operated by George Morris, is just finishing grading down the slopes at the intersection of two highways. The shovel, also a D-2, was out of a job when the picture was taken.



J. M. Robertson's ½-yard shovel loading gravel near Oneonta, New York.

Additional Highway Forecast

Supplementing the very complete highway forecast which appeared in the January issue of Excavating Engineer we present here additional information received from several states.

Arizona

Arizona's highway budget as tentatively set up on December 29th provides for a total expenditure of $4,255,508. Of this $3,600,163 is from NRH funds; $132,733 from CWA funds and $522,512 from state funds. In addition there is $792,897 National Recovery municipal highway projects and $818,900 for National Recovery secondary highway projects.

Illinois

Chief Highway Engineer Ernst Lieberman advises that during 1933 the State of Illinois completed 723.67 miles of paving and resurfacing on the State Primary System. It also completed 103.03 miles of grading and 115 bridges.

The counties of Illinois using their share of Motor Fuel Tax allotments from the State and funds derived from tax levies have completed 407.77 miles of surfacing with gravel or macadam, 107.04 miles of concrete pavement, 115.80 miles of grading and 138 bridges on the State Aid or Secondary System of highways.

The State's program for 1934 including approximately $17,500,000 of National Recovery funds allotted to Illinois will total approximately $30,000,000. This will provide for the construction of about 50 miles of grading, 285 miles of graveling, 490 miles of high type pavement, 100 bridges, 80 grade separations and five large bridges over the Illinois River. The above includes work on the State primary system and city streets and secondary roads.

The counties of Illinois will receive allotments amounting to approximately $9,400,000, as their share of the gasoline tax collections, and will receive approximately $2,500,000 in refunds from the State during the calendar year 1934; in addition they will possibly levy taxes for highway purposes totaling approximately $6,000,000. These funds will enable the counties to carry on a considerable program.

Iowa

The Iowa State Highway Commission completed in 1933 137.9 miles of paving; 4.8 miles of treated gravel; 225.7 miles of graveling; 117 miles of grading and 884 bridges and culverts. As of December 1, 1933 Iowa had in the Primary Road System 4,202.3 miles of paved highway; 139.2 miles of treated gravel; 3,082.7 miles of gravel; 51.9 miles of graded highway and 353.6 miles of unimproved road. The total mileage in the Primary System amounts to 7,829.7 miles. Carried over on existing contracts as of December 1st were 89.9 miles of paving; 3.3 miles of graveling; 89.9 miles of grading and 353 bridges and culverts.

During 1933 contract expenditures totaled $11,517,327 of which $8,848,352 were for construction. Paving totaled $3,225,803; treated gravel $96,764; gravel $647,446; grading $1,685,482; bridge and culverts $949,535; other construction $68,959; right of way $601,560; engineering, administration and inspection $721,837; reimbursements to counties for expenditures made prior to 1927 on the Primary Road System $833,973 and miscellaneous expenditures $16,989.

The status of the National Recovery Act program on December 31st, 1933 showed 71 per cent of the state highway projects under contracts, 40 per cent of the municipal projects and 23 per cent of the secondary projects. Of the total program 53 per cent had been placed under contract. The total amount involved being $6,128,000. The estimated cost of the balance of the program is $1,775,000 on state highways; $1,685,000 on municipal projects, and $2,035,000 on secondary projects, a grand total of $5,495,000. Of this sum it is estimated that it will be necessary to furnish state funds amounting to $1,567,340 in order to complete the program. The work involved will consist of 34.8 miles of paving estimated to cost $1,073,000; 188.3 miles of treated gravel to cost $708,000; 31.0 miles of gravel to cost $53,000; 274.9 miles of grading to cost $2,308,000; 25 railroad crossing eliminations to cost $998,000; and 10 special bridges to cost $355,000.

In addition to the state funds necessary to complete the NRA program Iowa expects to have $1,500,000 for additional work. No detailed program for this fund has been developed. Should additional Federal appropriations be made part or all of this fund may be required to finance the right-of-way cost.

Missouri

The State Highway Department has recently completed a tabulation of work under contract carried over into 1934 which gives a very comprehensive summary of the work now underway. A copy of this tabulation furnished us through the courtesy of D. B. Levi, Engineer of Construction, shows that, of 43.58 miles of graded earth under construction by state forces, 27.15 miles were carried over into 1934 at an estimated cost of $73,680. Divisional maintenance forces are carrying over 9.90 miles of gravel surfacing to cost $30,615; 8.12 miles of reshaping roadway to cost $20,679; 3.01 miles of rock asphalt to cost $5,926; 1.63 miles of graded earth to cost $9,809; 11.20 miles of miscellaneous construction to cost $24,475. Work under contract carried over includes 60.320 miles of 20 ft. concrete pavement to cost $2,155,183; 21.46 miles of 10 ft. concrete pavement to cost $301,439; 11.15 miles of miscellaneous widths concrete pavement to cost $398,185. On contracts for gravel types carried over there are 171.97 miles of gravel surfacing to cost $961,932; 1.72 miles of crushed stone surfacing to cost $34,107; 25.88 miles of gravel haul to cost $15,470; 6.19 miles of crushed stone or gravel to cost $3,792; and 30.09 miles of miscellaneous types to cost $304,251. Contractors also have 457.55 miles of graded earth to complete at a cost of $2,706,022; 20.71 miles of oil mat at $36,944; 5.44 miles of rock asphalt to cost $62,652; and 10.48 miles of asphaltic surface to cost $359,514. Culverts and bridge work on contracts carried over total $385,948 and miscellaneous work $8,607. In all Missouri over $7,899,236 in highway construction.

Scooping up the Loose Ends in Brick Manufacture

Cleveland Builders Supply Company successfully mine 118 feet deep with 3-yard dragline to get uniform mixture and more economical operation

By HERBERT J. FARR, *Jr.*

THE manufacture of brick is similar to all other lines of manufacture in the fact that good equipment is the shortest way to lower manufacturing costs.

Cleveland Builders Supply Company has in operation a Class 24 Bucyrus-Erie dragline digging clay for a stiff mud plant with a capacity of 288,000 common brick per day. When the business warrants, they also dig clay for another plant of equal capacity with the same equipment. Previous to the installation of this dragline they used a battery of shovels which meant increased labor costs and constant fear of changing mixtures of clay.

Cut 75 feet wide, 118 feet deep

At the present time the dragline is working backward from a crater 75′ wide and 118′ deep. The clay is dug with a three-yard bucket swinging from a 100′ boom. It takes about one and one-half minutes to make a complete cycle. This set-up gives 300 to 325 yards of clay every 5 hours. This is far from maximum production as this piece of machinery is capable of digging a hole of approximately 250′ depth and will in addition handle a four and one-half yard bucket by shortening the boom about ten feet.

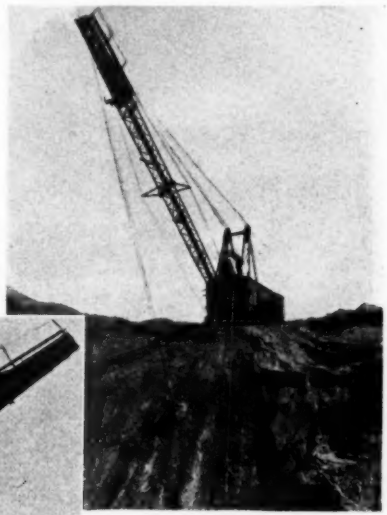
The clay is loaded into a stationary hopper which is bottomless and has clearance for five-yard, side-dump, hopper cars. Each car takes one charge and the train easily moves a new car into place as the bucket completes its trip. The same men that handle the smaller shovels are now operating the dragline and claim that although the reach is so much longer and the bucket larger, the big dragline handles just as easily as the smaller equipment.

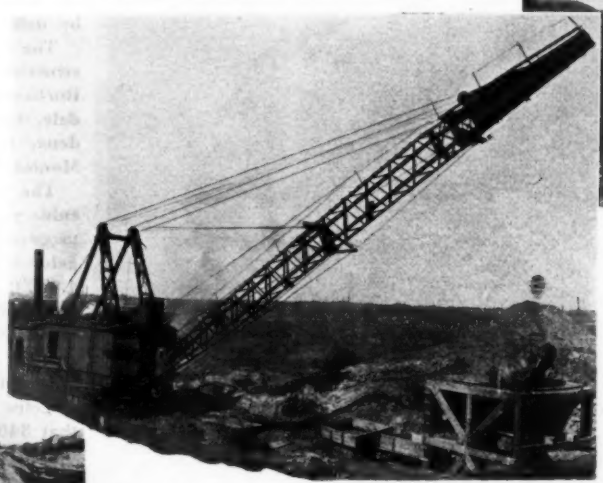
The Class 24 has been designed with enough flexibility to be used for any excavation. At any time the bucket on the dragline may be dropped off and a sling attached for handling material from cars.

The management reports that the big dragline is satisfactory in every way and they are highly pleased with results obtained.

Money saved a pleasant surprise to owners

When the dragline was first put into operation the object was to obtain a better mixture rather than with any hope of materially reducing costs. The desired result was obtained and the quality of the ware produced is very uniform due to the depth of the cut which crosses through several alternate layers of blue and yellow clay. However, in addition, there proved to be a very substantial reduction in production costs with the new method of operation. Since Cleveland Builders Supply Company installed their first machine they have realized enough savings to warrant changing another plant over to this same method.





These three views give some idea of the method used to solve Cleveland Builders Supply Company's mixing problem. A Class 24 Bucyrus-Erie dragline did the trick and cut mining costs besides.

Progress on Coxcomb Tunnel

By JOS. C. COYLE

Winston Brothers Company is making good time on six-mile Aqueduct bore.

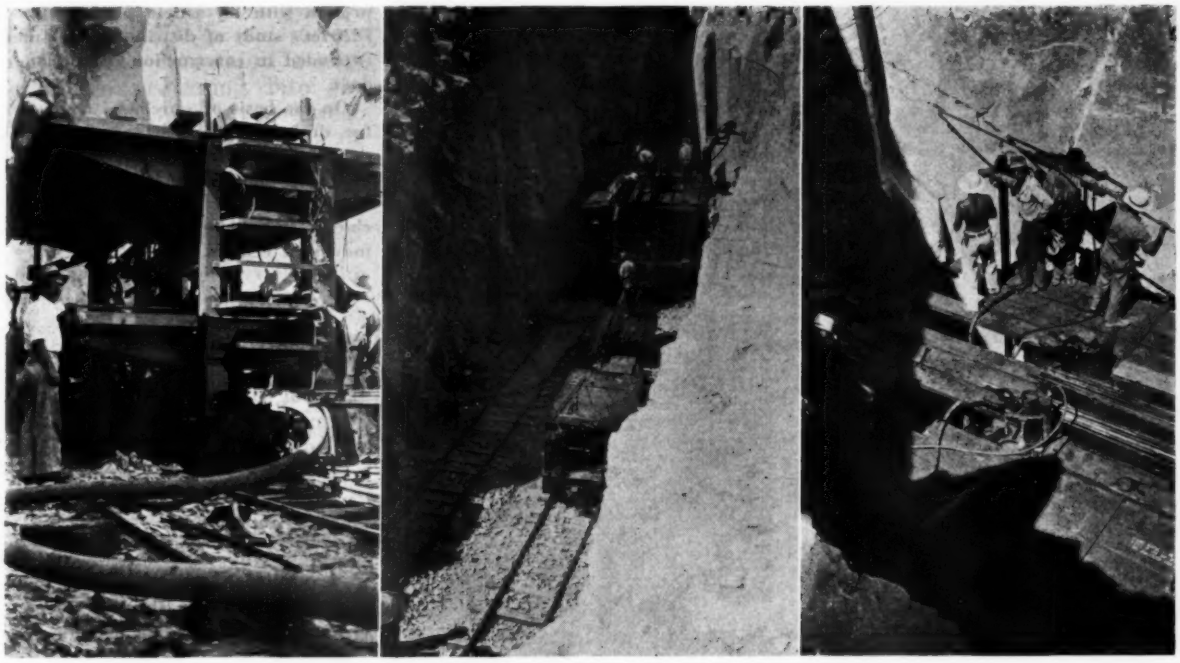
Loading in the approach cut. Note rock formation and type of digging.

EDITOR'S NOTE—This article deals with Winston Brothers' Coxcomb tunnel job, a part of the great Colorado River Aqueduct. Along the Parker route, selected from more than 100 proposed routes, the aqueduct will carry Southern California's water supply 241 miles from the intake at Parker Dam to the terminal reservoir. It will consist of 66 miles of canal, 56 miles of conduit, 28 miles of pressure pipe lines and 91 miles of tunnels. The latter are 16 feet in diameter and the conduits will be 16 x 19 feet.

The average capacity of the aqueduct will be 1500 second feet or approximately one billion gallons per day. 980,000 acre feet of water will be delivered per year.

The cities participating in the construction are: Anaheim, Beverly Hills, Burbank, Compton, Fullerton, Glendale, Long Beach, Los Angeles, Pasadena, San Marino, Santa Ana, Santa Monica and Torrance.

The project will require 44,600,000 cubic yards of excavation—enough dirt to cover Pershing Square of Los Angeles more than a depth of a mile. 4,730,000 cubic yards of concrete are required. This quantity may be better visualized by realizing that an equal amount of concrete would be required to build a 14-foot highway from Los Angeles to New York. It is estimated that 340 carloads of copper will be required and if this were made up into No. 000 wire it would reach from Los Angeles to Hongkong. The project is expected to use 41,000,000 pounds of powder. Construction has made necessary the building of about 250 miles of highway, 130 miles of which have been paved. Water lines to supply

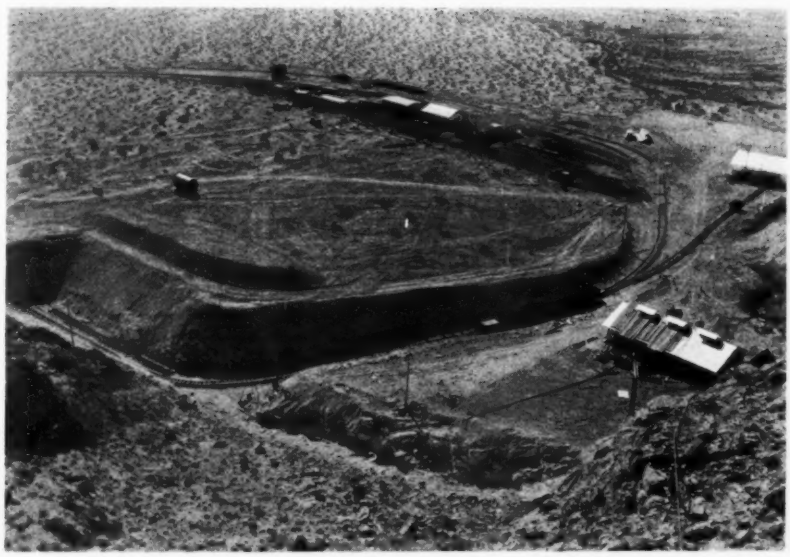


Drilling operations in approach cut.

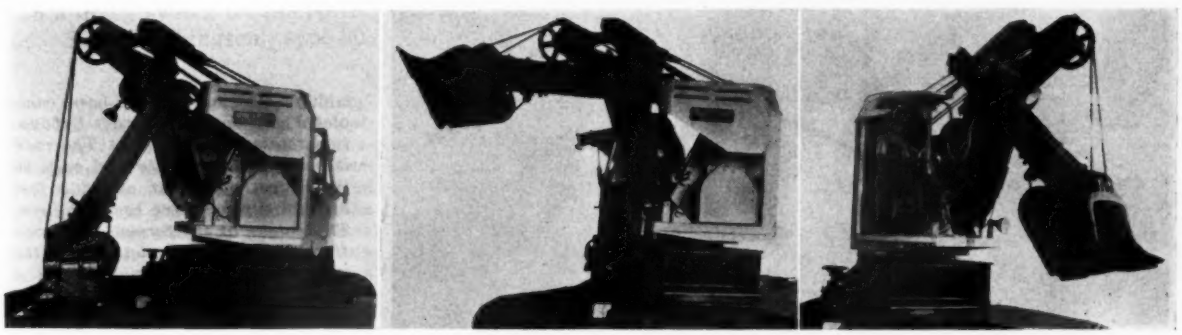
the camps total about 250 miles and 185 miles of this is across desert mostly in six-inch steel pipe. Electric lines to supply power total 196 miles of 66 kv. line and 232 miles of 33 kv. line. There will also be a 200-mile high voltage line to be built from Hoover Dam to the five pump lifts along the aqueduct.

It is estimated that six years will be required for completion of the project and an average of 10,000 men will be directly employed over the entire construction period with a maximum of 16,000 men at the peak.

The project is estimated to cost $220,000,000 which is covered by a bond issue authorized by the voters of the district September 29, 1931. So far construction obligating approximately $60,000,000 has been started. Contracts made have run several million dollars under the estimates. The Federal Government has loaned funds as



Shops, dump and approach.



These pictures give some idea of the working ranges of the TE-5 Tunnel Shovel

Looking into the east portal at Coxcomb shortly after the work underground started.

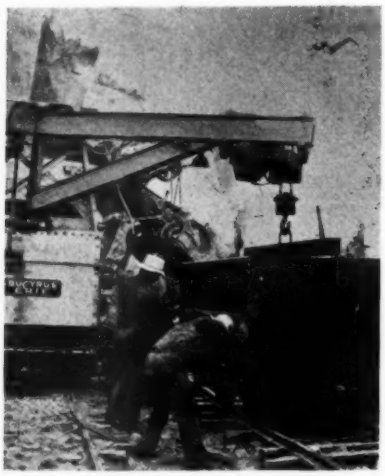
needed through the Public Works appropriations, taking over the bonds of the district as security.

At present Southern California is using all available annual rainfall and drawing 200,000,000 gallons a day from its underground water supply. This means rapid depletion of present water resources levels of which are dropping from 2 to 20 feet a year. Salt water is also coming in along the coast as the fresh water levels are lowered. Increase in population will add to the seriousness of the situation regarding water in years to come. To meet these conditions the Colorado River Aqueduct was planned and construction is being pushed forward as rapidly as possible.

Further articles descriptive of various sections of the work will appear in Excavating Engineer from time to time. A complete map of the project appeared in the January issue in connection with an article presenting the District's study of distribution of funds expended in construction of the Aqueduct.

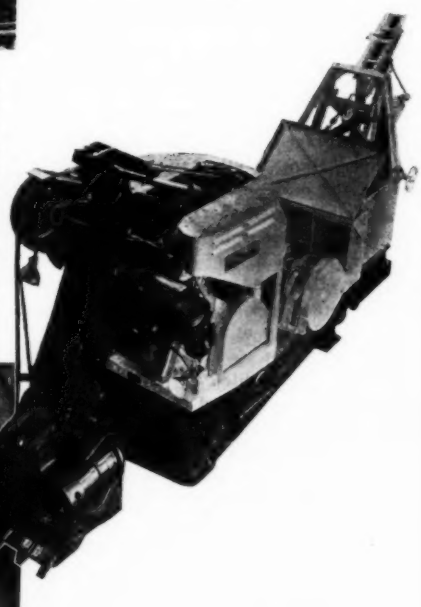
On the basis of purchases made thus far, during the early stages of the work on the project, more than 73 per cent of the expenditures have been made outside of the state of California, chiefly in middle western and eastern industrial centers.

—Editor



Cherry Picker in Action — Empty cars are shoved in on a track directly behind the shovel. As soon as a car is loaded, the load-train on the track alongside the shovel pulls back, the cherry picker lifts an empty off the empty-track and swings it to the loading-track, it is pushed up into loading position and coupled in with the load-train. Cars are usually transferred in this manner in about 20-seconds.

EXCELLENT progress has been made on the 91 miles of tunnels being driven on the main line of the Colorado River Aqueduct, one of the West's largest construction projects undertaken in many years, and which is intended to double the water supply of the Los Angeles Metropolitan area. Among other tunnels now well under ground is the Coxcomb bore, which was awarded to Winston Brothers Company for $1,624,515.35. It is



2,136-feet of tunnel had been completed on January 23rd. Excavation totaled 23,320 yards. The rock is solid, rocky granite and only 86 lineal feet of timber and 204 feet of steel support have been required. The nature of the formation is well shown in the lower picture and the view at the upper right gives a view of the tunnel shovel as it appears from the heading.

situated about 92 miles west of the aqueduct intake and pierces the Coxcomb mountains, a rugged range projecting into the Chuckawalla valley between Granite and Iron mountains on the east and Eagle mountains on the west.

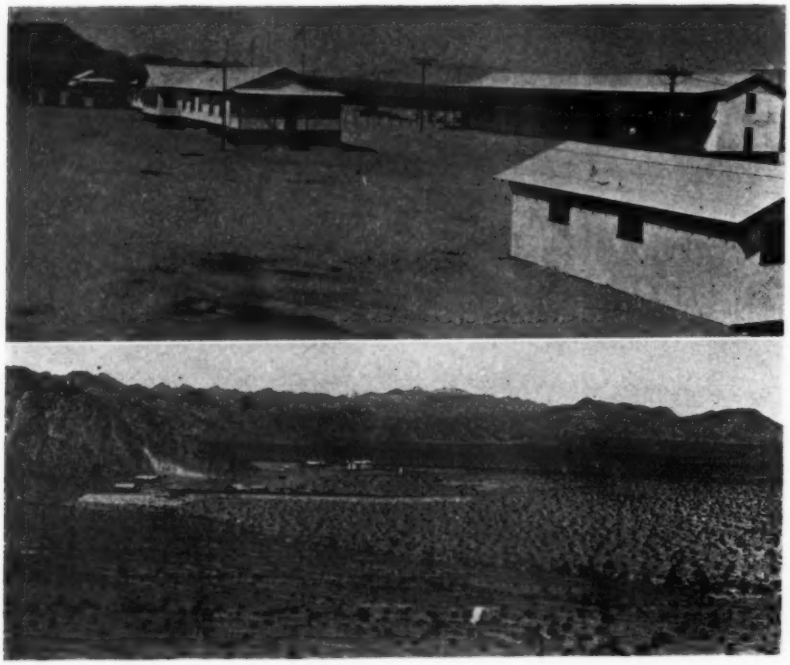
2,136 feet of tunnel excavated

The tunnel is being driven on tangent, through a massive granite formation and at this writing (January 23rd) is 2,136 feet underground. The blocky nature of the rock and the presence of many fractures and shear planes makes little secondary blasting necessary. The illustrations give some idea of the loading problem. Though it is about as tough a rock loading job as you'll find, the muck is being readily loaded with the Bucyrus-Erie TE-5 electric tunnel shovel. Work is being carried on through the east portal, where the open cut approach is 340 feet long, with a width in rock of 16 feet and in earthy sections 26 feet. Height at tunnel portal is 70 feet. An open cut of similar width and 122 feet long was also made at the west portal, with a face 65 feet high. Operations began in May and the tunnel is scheduled to be completed in 62 months. 83 men are employed.

23,320 yards excavated

The bore is 16 feet in diameter, inside the lining, which will be of concrete, and is being driven on a full face, drilling from a Jumbo mounting on 36" gauge trucks in order to provide three working levels. About 48 holes constitute a round and are drilled in 9 feet as a rule. Firing is done with a firing switch on the power line. Six Worthington, type-80,

Action views of the TE-5 Bucyrus-Erie tunnel shovel. After putting this machine to work at Coxcomb, Winston Brothers purchased a second TE-5 for their Iron Mountain job—West Construction Company also has one of these machines on its Whitewater tunnel job for the Metropolitan Water District. The West machine is crawler mounted while the Winston machines are wheel mounted.



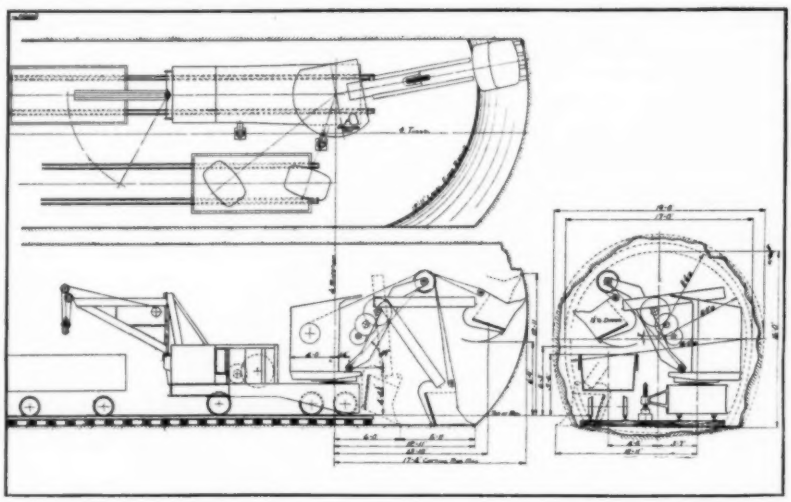
Winston Brothers camp at Coxcomb is thoroughly modern and air conditioned. The lower view shows typical landscape along the route of the aqueduct—sagebrush and sand. From these desert areas the mountains rise in rocky ranges through which tunnels will carry the previous water westward to the metropolitan area of southern California.

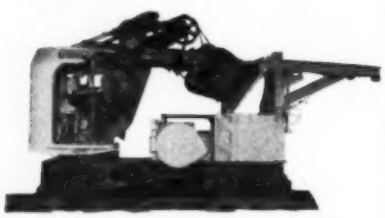
drifters are used, air being furnished by three Sullivan compressors. Hercules and Giant, 40 and 60 per cent gelatin stick powder is used. To date (January 23rd) 86 linear feet of timber and 204 linear feet of steel support have been placed by the heading crews at soft points. The concrete lining will be placed after the excavation is completed, or at least has advanced considerably. The tunnel is 17,530 feet long, the total excavation amounting to 190,000 cubic yards. Of this 23,320 yards has been moved.

Ventilation is by a G.E. centrifugal compressor, blowing and exhausting through a 20-inch metal pipe. Blowing at 3000 cfm and exhausting at 5500 to 6000 cfm. The tunnel is double tracked at the heading and rock is loaded with the Bucyrus-Erie tunnel shovel directly into trains of eight 4-yard Western dump cars, pulled by G.E. 9-ton storage battery locomotives. Rock is wasted at the dump.

Crew housed in comfortable camp

An air-cooled camp has been erected at the east portal, consisting of one office and dormitory, housing 19 men, including the superintendent, foremen and clerical force; one 80-man two-story dormitory; one mess hall and commissary and one change-house and first aid unit (The base hospital serving this camp and Winston Brothers Company's East Iron Mountain camp is at





This interesting tunnel shovel is a full-revolving digging unit mounted on a long car body which carries a "cherry picker" or car-transfer-crane at the rear. It ingenuously combines the advantages of the railroad and full-revolving types adding a railway crane for good measure.

The TE-5 tunnel shovel used by Winston Brothers is a recent development deserving somewhat detailed description. A working range diagram is shown above. The machine weighs 78,000 pounds, is equipped with a 1¼-cubic yard dipper, cleans up a 12'11" level floor radius. The cherry picker is an integral unit and shifts a car in about 20 seconds. Advantages claimed for the unit by Bucyrus-Erie engineers include: heavy duty construction; tremendous digging force that will handle extremely tough rock digging; will scale partly loosened rock off face and walls; downward crowding force at 31,500 pounds that enables it to dig a level floor without difficulty; wide working range that gives long moveup; dipper can be used effectively as a flexible platform for cleaning roof; operator located on swing circle, has clear view of dipper and car being loaded; dipper can be lifted over and placed behind large rocks that roll in close to car body; complete electrical control—power dipper trip; quarry type dipper, two-piece, all cast; can move under own power or power can be instantly disconnected for hauling by locomotive; operator and machinery fully protected against falling rocks; parts easily accessible; flexible reach distributes load evenly in car, filling corners; dipper can be used to rerail car if necessary; can dig compacted gravel or boulders without blasting; efficient cherry-picker transfers cars promptly without delay to digging operations.

General Electric motors furnish the power units for the tunnel shovel which loads into Western 4-yard cars drawn by General Electric locomotives. Notice how the shovel easily reaches any portion of the car when loading so that a well distributed load results.

the latter place, about 18 miles N.W. of Freda Siding, on the Santa Fe railroad).

Every means has been employed at the Coxcomb camp to minimize the effects of the severe desert heat during the summer months. The camp is conducted by Anderson Brothers Supply Company, commissary sub-contractors. Water is supplied by the Metropolitan Water District and is piped to the various camps along the aqueduct, from wells drilled adjacent to the aqueduct at strategic points.

Frank E. Weymouth is General Manager and Chief Engineer of the Metropolitan Water District. J. L. Burkholder is Assistant General Manager. John Stearns is Division Engineer of division 3 in which the Coxcomb tunnel is included.

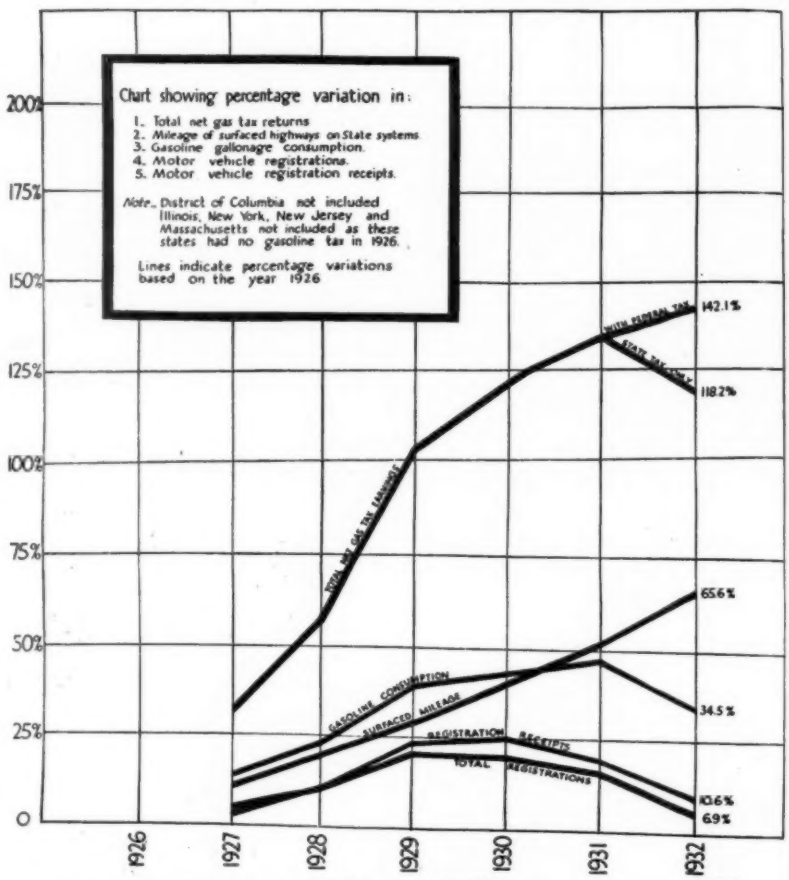
TRENDS in Highway Earnings

THE ACCOMPANYING chart recently prepared by the National Highway Users Conference shows the comparative trend in gas tax earnings, gasoline consumption, surfaced mileage, auto registrations receipts, and total registrations. It is an interesting study and might be of further interest as a basis of comparison of trends in your own state.

It is interesting to note that the average trend of the increased surface mileage appeared to have a greater pull on gas consumption up to 1931 than did the average trend of car registrations, which were decreasing for two years while gas consumption was continuing to increase. Incidentally, it is probable that the consumption of gas per car-mile was decreasing steadily during this same period, due to improvements in automobile construction. For that reason it may be conjectured that the increase in car mileage from 1929 to 1931 must have been much greater than the increase in the gas consumption line might indicate.

A study of the chart suggests the desirability of analyzing comparative state trends to determine the effect that a sharp rise in gas taxes may have had in the gasoline consumption and motor car registrations. Consideration should be given to the decrease in the selling price of gasoline, which has, to a considerable degree, offset the increase in gasoline taxes. But a more detailed study of the national trends in comparison with trends in individual states, where the gas taxes are either materially above or below the average, might lead to more definite conclusions in connection with conflicting theories in regard to gasoline taxes.

For instance, in comparing the trends in the state of Missouri, where the gas tax has remained



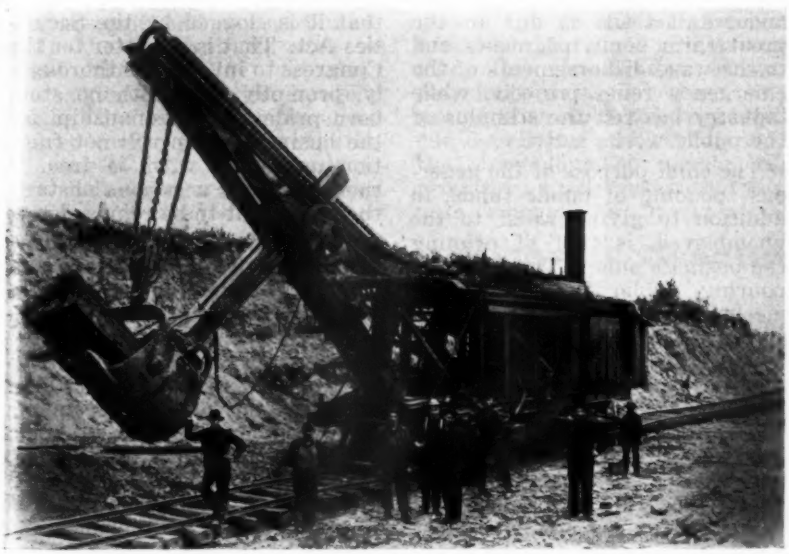
Gasoline Consumption per Vehicle—end of 1926	*453.3*
Gasoline Consumption per Vehicle—end of 1932	*570.3*
Percentage Increase of 1932 Consumption over 1926	*25.9*
Gasoline Tax Earnings per Vehicle—end of 1926	*10.73*
Gasoline Tax Earnings per Vehicle—end of 1932	*24.33*
Percentage Increase of 1932 Gas Tax Earnings over 1926	*127.0*

at the same rate (two cents) since it was imposed in 1924, the observer is immediately impressed with two conclusions. First, the increase in that state in surfaced mileage has been much greater than the average since 1926 and the increase in gasoline consumption has likewise been much greater than the average. Second, with a constitutional limit of two cents on the state gas tax, it has been possible to increase the percentage of surfaced mileage far above the average in other states where the gas tax has been constantly increased during the same period.

This comparison seems to indicate therefore that while good roads increase gasoline consumption materially, exhorbitant gas taxes are not essential to obtain the desired increase in good roads.

The research department of the National Highway Users' Conference points out that the study presented has been made merely for the purposes of securing a starting point. It is hoped this will open the door to further research and comparison from which some authentic and helpful conclusions may possibly be reached.

Old Times & Old Timers



Stripping Spring Mine

AN OLD TIMER from the Masaba Range, I. M. Stopnik, tells us about this old time Vulcan from Toledo in the following letter:

"Under separate cover I am sending you a photo of a old Vulcan shovel which I fired in 1908. I thought you might be able to use it in your Old Timers' page.

"The following is a brief description. The shovel was a 65-ton crane-type Vulcan No. 142 built at Toledo, Ohio. Owned and operated by G. H. St. Clair, mining man on the Mesaba Range. The swinging circle was overhead and was swung by chains connected to a swinging drum operated by an engine just under the roof. The fireman had to go on the roof to oil it up. Boiler was a Marine, return-tube type with smoke box in the fire hold or "dog house" as it is commonly called, which made it extremely warm for the fireman as neither the boiler or smoke box were covered. It was a hand-friction machine with no foot brake. Instead of a brake disc the hoist drum had a ratchet disc with a pawl or "dog" which was engaged into it when desiring to move up. Then a clutch had to be thrown out to disconnect the drum from the hoist shaft and another clutch had to be thrown in to engage it with the propelling shaft. The swinging lever was connected on the same shaft as the hoist throttle so they were both overhead.

"There were no lubricators on the shovel. All the engines received their oil from a hand-operated oil pump mounted on a bracket on the side of the boiler and operated by the fireman. Another busy job.

"The picture was taken in 1908 while the shovel was engaged in stripping the Spring Mine six miles from Mesaba, Minnesota.

"The day crew is shown on the picture and consisted of J. B. Patterson, operator; J. Anderson, Craner; and I. M. Stopnik, fireman. The night crew was Ed Thomas, operator; Sam Kulvander, craner and Pat McCourt, fireman.

"It was certainly a work house to keep this shovel going. We regularly spent two hours a day and all day Sunday repairing."

Thank you, Old Timer Stopnik. Remember the boom days up there in northern Minnesota? The Range packed a busy mining camp from end to end! Thousands of track laborers, dumpmen, powder monkeys, plus the shovel, locomotive, shop and office crews, kept the mines and towns humming day and night. 12-hour shifts, seven days a week—stripping all winter—loading ore all summer! Saloons so close together a single stagger took you from one to the next. And the old timers gathered around the bunk house stove and argued loud and long as to the merits of their favorite shovel, bragged about loading records, worried about the weather, and cussed the cook.

Those were the days!

Sam Davis Meets an Old Friend

OLD TIMER Sam Davis received somewhat of a shock when he opened our March issue to the picture of "Old 49". He writes:

"Received March copy and was surprised to see the 'Old Relic' Henry C. Inch of Hurley, Wisconsin, described in that issue. It was the shovel I started my career on and have been at it since.

"The shovel was shipped into Eveleth, Minnesota, along in 1900 by the Spruce Iron Mining Company, branch of the Sharon Steel Company, Sharon, Pennsylvania, Chas. Wallace Kimberley, Superintendent. I was messenger at the time and the Company was taken over by the Oliver Iron Mining Company a few years later. In the spring of 1907 Richard Traverthen, Jr., and myself started to prepare it for shipment to Iron Belt, Wisconsin. Upon attempting to raise the boom, we could not budge it so we rigged a tripod and a 5-ton chain block to help the hoisting engine enough to release the strain rods from trunnion. It was a Bay City, friction, crane shovel with a Barnhardt boom engine to replace friction crowd. Water tank was strapped on rear of shovel, had to be taken down for shipping. Had to keep it on two ties to get over the old 25-ton wood ore cars in use those days. A 'relic' is right but O.K. 30 years ago."

Thanks for the letter, Sam, and good luck to you.

More Kilgore History

OLD TIMER C. A. Sears contributes his bit of experience to the Kilgore history. Mr. Sears tells us that he had quite a bit of correspondence with the manufacturers of this shovel back in 1904 and he finally reported to the Chicago Sand and Gravel Company to operate one for a gentleman by the name of Williams. As he recollects it a member of the manufacturer's firm acted as the erector. Says Mr. Sears:

"He was stripping about six

(Continued on Page 105)

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The Business Situation

IT IS FIVE YEARS since we have had the pleasure of greeting a new calendar year with business conditions better than they were the year before. For the first time since 1929 the curves showing business activity begin the calendar year at a point above a year ago. This condition breeds optimism and particularly so since we have already undergone one reaction in our general business activity increase.

The Cleveland Trust Company bulletin for January 15th has commented so aptly and so well upon two phases of the current situation that we quote them in the following paragraphs.

Public expenditures are responsible for much of the improvement. A considerable portion of the recent advances in wholesale and retail trade is due to the great farm bonus payments and to the wage disbursements of the emergency relief projects, while industry has felt the stimulus of the public works activity.

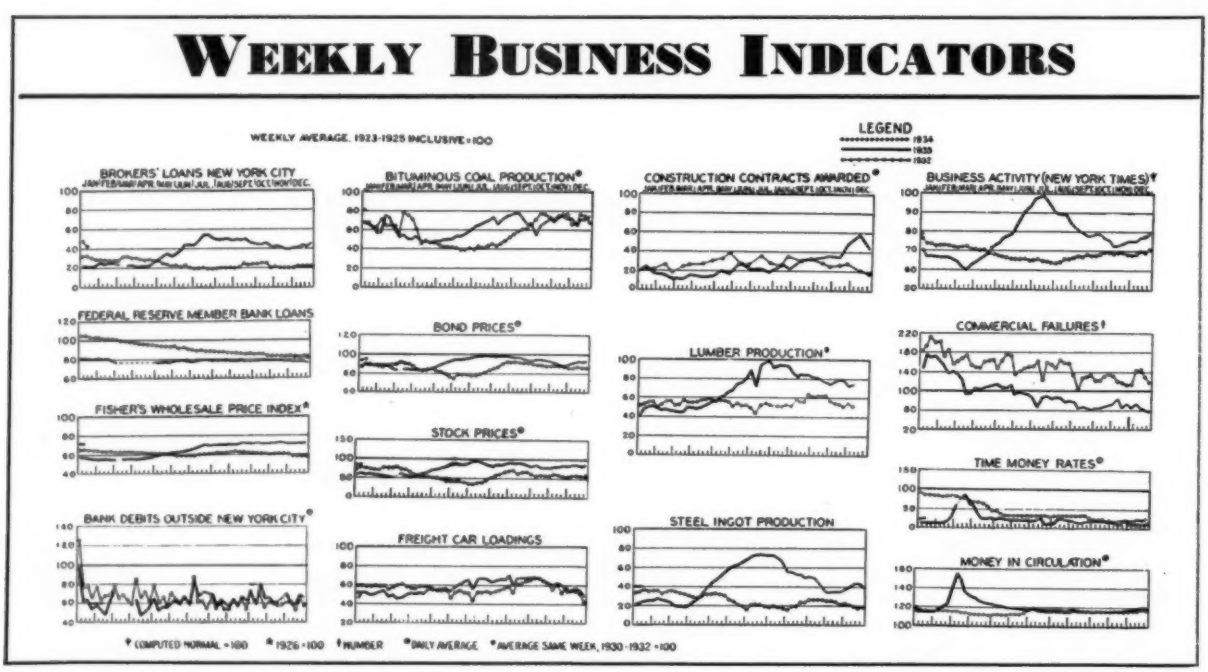
The chief purpose of the generous spending of public funds, in addition to giving relief to the unemployed, is that of priming the business pump. The object of pouring public funds into the mechanism is to cause a normal stream of private funds to start flowing through it. The next few months will demonstrate how successful the attempt will be. The people are watching the experiment attentively, hopefully, and with a good deal of confidence. They are well aware that this Congress in its emergency session last spring not only made lavish provision of public funds with which to do the priming, but also hurriedly made extensive novel alterations and repairs to the pump itself.

The people furnish the power that operates the business pump, and they are eagerly anxious to be back at their old job of doing it. So far their accomplishment has been limited because the repair job of last spring has not yet proved wholly successful. The business pump has two valves; one the new-investment valve, and the other the profit valve. The investment valve is almost closed, and seems to be stuck tight. A good many people claim that it is clogged by the Securities Act. That is a matter for the Congress to investigate thoroughly, promptly, and with no stubborn pride of craftsmanship, for the business pump will not function until that valve is free. If there really is a serious obstacle there it ought to be removed.

The profit valve is operating intermittently and is leaking badly. Our business pump was so designed as to provide it with wide freedom of action, but the adjustments of last spring greatly restricted its movements. The repair group had disagreements about it, some claiming it should be left alone, and a few holding that it should be kept permanently closed. The compromise taken was to leave it partly opened and always leaking. The job of Congress is to finish its repair job before it uses up all the priming water, for the available supply is strictly limited.

Business recovery can be continued in the long run only by the progressive substitution of a flow of private expenditures for that of public expenditures. If there exist obstacles preventing that substitution they have been unintentionally created by the Congress, and could be removed by it. Lavish public expenditure to create recovery that private en-

WEEKLY BUSINESS INDICATORS



terprise could not sustain would be futile and perhaps disastrous.

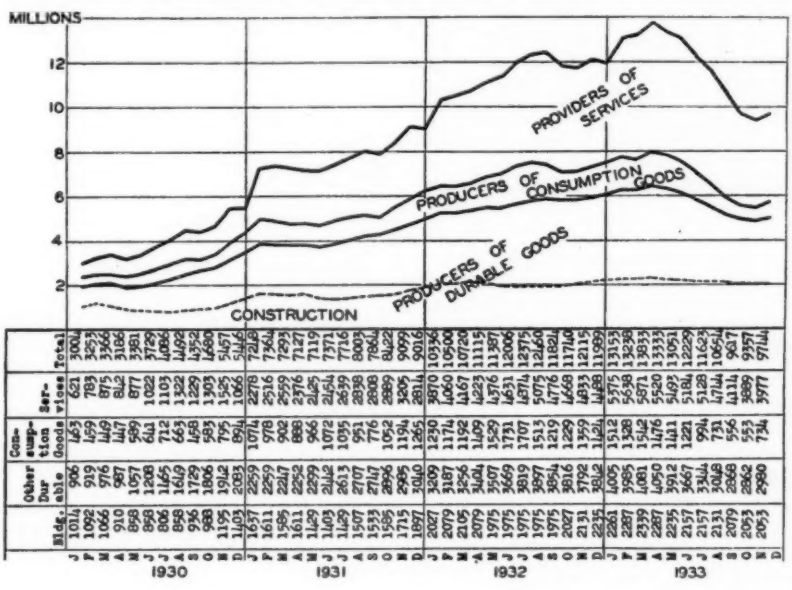
The accompanying diagram shows an attempt to estimate unemployment, and its distribution.

In the diagram the area between the base line just above the figures, and the irregular dashed line, represents the unemployed each month since the beginning of 1930 in the construction industries, while the lowest column of figures gives their numbers in thousands of workers. Buildings are durable goods and so are many industrial products made of such lasting materials as the metals, lumber, cement, clay, glass, and stone. The unemployed in these other durable goods industries are represented by the area between the dashed line and the lowest solid line, and their estimated numbers in thousands are stated in the second column of the table.

The area between the next two solid lines represents the unemployed in the industries making or raising consumption goods such as foods, and textiles, and articles made of paper, rubber, leather, and the like. The figures are in the third column. The uppermost area, and the figures in the fourth column, represent unemployed in the service occupations such as wholesale and retail trade, transportation, communication, professions, public positions, and domestic work.

The Census of 1930, showed about 49 million people in gainful occupations, of whom about 26 million were producers of goods, and the remaining 23 million providers of services. Last March almost 14 million of them were out of work. Of the 23 millions of providers of services almost six million were unemployed, and among the 26 million producers of goods about eight million were idle. The classification of employment data in these two groups is an aid in thinking about our depression problem for it is the unemployment among the producers that causes the idleness among the providers of services.

It is highly significant that roughly one-half of the unemployment is caused by the other half of it. If we could return the producers to work, the problems of the service workers would largely solve themselves. The controlling factor in unemployment among the producers is that of the workers in the durable goods industries. There is the key to our depression problem.



	Bldg.	Other Durable	Consumption Goods	Services	Total
J	1014	906	453	621	3004
F	1092	919	469	783	3263
M	1066	976	449	875	3366
A	910	987	447	842	3186
M	898	1057	599	877	3381
J	898	1208	641	1022	3729
J	806	1465	712	1101	4086
A	858	1649	663	1322	4492
S	936	1729	698	1229	4352
O	988	1806	583	1393	4660
N	1195	1942	775	1525	5437
D	1403	2083	894	1066	5446
J	1657	2259	1074	2276	7266
F	1611	2259	978	2516	7364
M	1595	2247	902	2559	7291
A	1611	2252	888	2376	7127
M	1429	2239	966	2425	7119
J	1405	2442	1072	2464	7371
J	1429	2613	1095	2559	7716
A	1507	2707	776	2830	8005
S	1553	2747	1052	2808	7864
O	1595	2896	2889	2889	8422
N	1715	2985	1194	3205	9099
D	1897	3040	1265	2814	9016
J	2027	3209	1250	3870	10356
F	2079	3187	1174	4060	10500
M	2105	3256	1192	4167	10720
A	1975	3404	1409	4223	11115
M	1975	3507	1529	4376	11387
J	1975	3669	1731	4631	12006
J	1975	3819	1707	4774	12275
A	1975	3997	1513	5075	12460
S	1975	3954	1219	4776	11824
O	2027	3916	1289	4669	11740
N	2131	3792	1359	4853	12115
D	2235	3842	1421	4469	11969
J	2261	4005	1512	5375	13153
F	2287	3985	1328	5630	13238
M	2339	4001	1542	5971	13933
A	2287	4050	1476	5520	13333
M	2235	3912	1411	5497	13051
J	2157	3667	1221	5184	12229
J	2157	3344	994	5128	11623
A	2131	3048	731	4744	10654
S	2079	2866	556	4114	9617
O	2053	2862	553	3889	9357
N	2053	2980	734	3977	9744
D					

Highway Beautification Worth While

USE of C.W.A. funds under supervision of the State Highway Departments for highway beautification is a splendid outlet for the surplus labor utilized under the C.W.A. plan.

Raw ditches, rank growths of fast breeding weeds and our great American billboards border too much of our highway system.

The writer will never forget the intense pleasure experienced in driving over northern Michigan roads where the virgin and second growth timber had been cleaned up and made into a continuous park for a distance of two to four hundred feet on each side of practically all of the main State Highways. Between Burlington and Beloit, Wisconsin is a half mile stretch of giant elms arched overhead that gives to every passing motorist a thrill of pleasure not soon to be forgotten. Columbia County, Wisconsin earns the gratitude of the passing traveler with its neatly trimmed roadsides and attractive little plots of old-fashioned flowers scattered along at the road crossings, in roadside borrow pits and wherever their beauty will be most appealing to the passer-by.

Each of our readers can probably name from one to a dozen similar instances of successful highway beautification along highways with which he is familiar.

It is unfortunate, however, that they are so few. The demand for new and better roads came so rapidly with the quick development and almost universal use of our automobiles that our first need was for smooth, safe and commodious highways. We have by no means satisfied this primary requirement but we have gone sufficiently far along the way toward the realization of this need so that we should begin giving more universal attention to the cleaning up of roadsides, sodding or seeding good grass, planting of trees and shrubbery along our roads.

Revenue for extending and maintaining our highways is gladly furnished by their users through license fees and gasoline taxes. Beautification of highways will lead to increased use of our American institution, the automobile, and thus repay the investment.

Work of this kind fits in perfectly with the need of the C.W.A. for a large volume of employment requiring hand labor. Here is a place where there is needed work to do and hand labor is the most efficient way to do it. The State Highway Departments and the C.W.A. are to be congratulated in their cooperative efforts along this line.

FIELD NOTES

To Move Full-Grown Trees

IN THE OLD DAYS trees used to stay put. At least until they felt the sting of an axe. With the aid of modern tree moving machinery such as that shown in the accompanying photographs, however, tree men now move and transplant 60 and 70 foot trees like so many pots of crocuses. In other words, if you want a 90

year old tree in your front yard, you don't need to wait for a sapling to grow up. You can have a nice veteran elm moved in tomorrow.

The mover shown in the upper illustration is used to maneuver specimens weighing up to 30 tons or more. It's all steel—and it's all electric welded in the shops of the *Davey Tree Expert Company, Kent, Ohio.* The smaller mover only carries loads up to around ten tons.

Due to the nature of the service, these movers are frequently over-loaded, stuck in heavy mud, twisted, pulled, pushed but seldom broken. It is reported that no weld failures have ever occurred.

Check Lubrication and Save Repair Bills

ON INSPECTING a gasoline shovel a short while ago it was found that the operator had never checked the oil reservoir that carries the oil for lubricating the bevel pinions on the horizontal transmission shaft and the bevel gear on the vertical transmission shaft. The packing around the shaft had become worn and the oil leaked out. The oil, however, was never replaced and the result was that the gears were badly cut from having run dry for several weeks. They will soon have to be replaced, long before any appreciable wear should have become evident.

CCC Fights Coal Mine Fires

DAY AFTER day for a period of four months 200 CCC men have fought a series of coal bed fires on the public lands in Campbell County, Wyoming. These fires have been burning for a period of years extending back to the presettlement days.

Since coal was first discovered and used in Manchuria 3,000 years ago man has been bothered with coal fires not only on the surface but in active and abandoned mines. Coal bed fires destroy grazing lands and, by interrupting normal drainage, cause heavy losses by soil erosion.

In past years these fires which have met with no well-financed, organized resistance have destroyed an incalculable amount of coal resources in the U. S. and through their action on the overlying strata have destroyed the value of vast areas of the surface.

The coal beds of Campbell County range up to 100 feet in thickness with overburden from a few feet to 60 feet. Practically the entire bed is reserved by the Federal government. For this reason these beds were selected for experimental work.

A camp was established just outside of the city of Gillette on June 15th and, under the advise of experienced members of the geological survey the CCC crew worked steadily from the time the camp was established until its abandonment in the middle of October.

The use of water to combat the fire was out of the question. Unless a fire of this kind can be completely flooded it is impractical. The use of small quantities of water cause small explosions. Large quantities could not be obtained. The methods successfully applied were, where the coal was burning on the surface, to first cover lightly with dirt to reduce the heat, then dig up the burning coal and remove it to other points where it could be spread out in a thin layer, mixed with fine dirt and be covered with a layer of dirt and non-combustible shale twenty inches thick. Where the fires were burning below the surface the supply of air was shut off by completely sealing the openings to the old mines or filling in the gullies and fissures so that the fires would eventually burn out from the lack of oxygen. Where these methods were not practical the burning beds were dug out, taken to the surface for spread in the same way as from the fires in surface coal. This method was more dangerous and on it the men were worked in short shifts of a few hours at a time. However, in the four months work there were no accidents and the men thrived on the job.

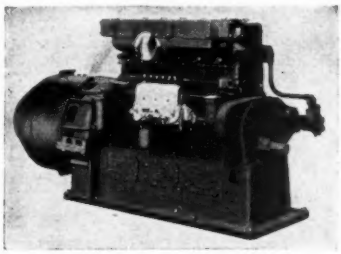
Able assistance was rendered by property owners and rangers in the district. 313,400 cubic yards of dirt was moved on the project, all of it being handled by hand labor with the use of teams and 12,000 pounds of high explosives.

Seven fires were completely extinguished. Others were so retarded and safe-guarded that it is not likely that they will break out in the future. Large areas of land can now be reclaimed for grazing purposes and a large volume of coal has been saved for the government. Its value may be realized when one considers that a single area of coal within six miles of Gillette contains 180,000 tons which will yield to the government $18,000 in royalty. From this coal 50,000 barrels of oil could be produced and 90,000 tons of coke secured as a bi-product.

EQUIPMENT
You Ought to Know About

Buda Diesel Generating Set

RECENTLY announced by *The Buda Company* of Harvey, Illinois, is a Diesel generating set producing electrical current at approximately ¾ to 1c per kilowatt. These sets range in



size from 10 to 90 KW, alternating and direct current. They do not require the services of an attendant, only an occasional visit to the engine room, possibly 2 or 3 times a day, being necessary. They are suitable for 24 hour service. Buda has also put on the market recently a small compact generator set fitted with natural gas or gasoline engine of similar design ranging from 5 to 75 KW capacity.

The 10 KW Diesel set weighs from 2350 to 2625 pounds and weights on other sizes range from this figure up to 3485 pounds for the 30 KW set. Fuel having a gravity of 26 to 28 degrees Baume can be used. The engine has 6 cylinders, well balanced, reducing vibration. Compressorless construction is used involving a system of injecting fuel into the cylinder without the aid of compressed air. The manufacturers claim unusual smooth, quiet performance owing to the special "shock absorbent head." Descriptive bulletin will be gladly furnished by the manufacturer.

Beg Your Pardon

IN JANUARY, through a typographical error, the name of the *Shanklin Manufacturing Company, Springfield, Illinois,* was misspelled as "Franklin" Mfg. Co. This company is the maker of the "Storm King" signal torch. Excavating Engineer regrets the printing of this mistake and hopes that it has caused no one serious inconvenience.

New Rock Grab Announced

RECENTLY announced by Bucyrus-Erie Company is a new Rock Grab specially adapted to handle rock or cutstone of practically any size or dimensions. The unit is unique in its simplicity, its ability to pick-up rock with a firm, sure grip, and place it just where it is wanted. It is claimed by the manufacturers that the new device will obsolete the customary dog and chain or sling methods through large savings in handling cost, greater safety and convenience.

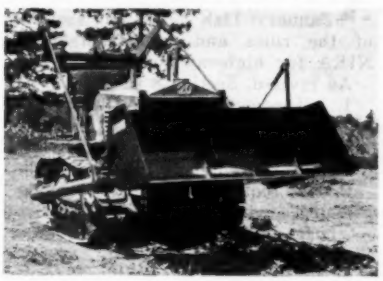
With this Bucyrus-Erie grab, rock may be tipped or rolled; it may be picked up even when surrounded by other pieces. It is laid down exactly in place without resetting, shifting or jacking. Releasing the closing line immediately frees the lifted object. No dog holes are necessary and

rubber pads can be supplied to permit handling polished stone without marring.

The Rock Grab is at present offered in three sizes of 2½, 5, 10 and 20-ton capacity. Complete information will gladly be furnished without obligation. Write *Bucyrus-Erie Company,* South Milwaukee, Wisconsin mentioning this publication.

Tractor Front End Loader

THE EUCLID Front End Loader is a compact, balanced unit which can be quickly attached to Cletrac 20, 25 or 35 tractor. The design utilizes the operating mechanism on the rear of the tractor thus giving better balance to the entire unit and also



eliminating dead weight ordinarily employed as counterweight. This gives better load distribution in addition to making possible a better balanced unit. The loader is hydraulically operated giving positive control with the ability to hold the loaded bucket in any position. For additional information or complete specifications write either the *Cleveland Tractor Company,* Euclid Avenue at East 193rd Street or *Euclid-Armington Road Machinery Company,* Chardon Road, both of Cleveland, Ohio. Please mention *Excavating Engineer* when writing.

Adnun Black Top Paver

AN IMPROVED black top paver is announced by the *Adnun Engineering and Manufacturing Company* of Nunda, New York. Manufacturers claim many advantages in handling either hot or cold mixes and is responsible for an accuracy impossible to secure by hand.

The paver is self propelled and rolls on the sub-grade and finished course. It consists of a hopper mounted on a sturdy frame carrying an operating platform, engine, and attendant mechanism. The front end is supported by two wheels that are engine-driven and steered from the platform. The rear end is mounted on four rollers also powered and controlled for steering.

The truckload of material is backed between the front wheels and dumped to the hopper. An agitator bar at the bottom of the hopper draws the material down to the grade where it is cut off

(Continued on Page 109)

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4. Material purchased from commercial sources and incorporated in the work shall be produced under the proper industrial code or the blanket code.

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On Monday were held executive sessions of the Code Authority, Code of Fair Competition for the Crushed Stone, Sand and Gravel and Slag Industries, for the purpose of organization. These sessions extended far into the night and resulted in the setting up of a permanent organization. Tuesday was given over to business meetings of the three associations and a joint session on the code. Wednesday was taken up by two joint sessions,

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Never before has such a meeting of the Crushed Stone, Sand and Gravel and Slag industries been held. Never, in the past, has such a large group of men tackled a problem with such serious intent and so effectively.

The following officers were elected: National Crushed Stone Association —President, Russel Rarey, Marble Cliff Quarries Company, Columbus, Ohio; Regional Vice-Presidents, Arthur S. Lane, Eastern Region; A. B. Mack, Central Region; T. I. Weston, Southern Region; E. Eikel, Southwestern Region; W. R. Sanborn, Northern Region; Porter W. Yett, Northwestern Region; C. M. Doolittle, Canadian Region; A. J. Wilson, Western Region, Chairman.

National Sand and Gravel Association—H. V. Owens, President (re-elected); G. W. Renwick, Vice-President, H. S. Davison, Treasurer. Executive committee: Paul P. Bird, Boston, Massachusetts; Alexander Foster, Jr., Philadelphia, Pennsylvania; M. A. Neville, Lafayette, Indiana; Lee T. McCourt, Memphis, Tennessee.

Civil Engineers Meet

THE EIGHTY-FIRST annual meeting of the American Society of Civil Engineers was held in New York January 17 to 20. Development planning and the governmental operation of utilities were the principal subjects of discussion. Harrison P. Eddy of Boston was elected to the presidency to succeed Alonzo J. Hammond.

Ceramic Convention February 11

THE AMERICAN CERAMIC SOCIETY will celebrate its thirty-fifth anniversary at its convention in Cincinnati on February 11th to 16th in the Netherland Plaza Hotel.

U. S. Engineers Budget $30,940,000

FOR the fiscal year from June 30, 1934 to June 30, 1935 the U. S. Engineers expect to spend on river and harbor work $30,940,000. Congress has asked for a new appropriation of $25,000,000 while $5,940,000 is available from appropriation made under the previous budget.

Mississippi River flood control will require $7,054,000 of which $532,000 will go for the Lower Mississippi and $6,522,000 for the Middle and Upper Mississippi. This includes work on the tributaries, there being $3,032,000 on the Mississippi, $2,000,000 on the Missouri and $1,337,000 for open channel work on the Ohio.

Rivers and harbors on the Atlantic coast are expected to cost $8,048,000 which includes $2,000,000 for the Delaware River below Philadelphia.

The Gulf Coast is to get $3,550,000 including approximately $500,000 each for the Southwest Pass on the Mississippi, the Sabine-Neches Waterway and Houston Ship Channel.

The Pacific Coast schedules calls for $3,205,000 including $374,000 for San Diego Harbor, $610,000 on the mouth of the Columbia and $685,000 for work on the Columbia and lower Willamette river below Vancouver and Portland.

Intracoastal Waterway is scheduled for $1,477,000 including $300,000 for the Chesapeake-Delaware waterway, $200,000 for work between Jacksonville and Miami, with $235,000 in the Louisiana-Texas waterway.

Work on the Great Lakes is expected to total $2,231,000. Work being carried on in the Detroit River will require an additional $2,547,000 but this is included as a separate item and is not in the $30,940,000 total. The same applies to various projects financed by funds from the Public Works Authority which are being carried out by the U. S. Engineers but are not included in the regular river and harbor program.

1st Operator—"The girl I married has a twin sister."

2nd Operator—"Gee! How do you tell them apart?"

1st Operator—"I don't; it's up to the other one to look out for herself."

Contractor: "You take accounting at college, don't you?"

Son: "Yes, sure."

Contractor: "Maybe you can account for the silk undies in your last laundry?"

Status of Public Works Highway Program

THE following tabulation shows the number of N.R.A. Federal Aid projects advertised for contract, the estimated cost of these projects, the percentage of state allotment represented by this estimated cost including funds furnished from other sources than P.W.A., the number of projects awarded and the percentage of allotment awarded as of January 13th. The tabulation is prepared from information furnished by the Bureau of Public Roads. The figures in this table include both force account and contract work.

State	Number of Projects Advertised	Work Advertised P.W.A. Funds	Percentage of Allotment	Estimated Total Cost	Number of Projects Awarded	Percentage of Allotment Awarded
Alabama	57	$3,549,000	42.4	$6,094,000	46	34.7
Arizona	37	3,558,000	68.3	4,148,000	28	57.5
Arkansas	65	2,241,000	33.2	2,804,000	49	27.7
California	118	11,711,000	75.0	15,352,000	94	62.0
Colorado	79	3,667,000	53.3	3,667,000	62	47.1
Connecticut	17	2,717,000	94.8	2,893,000	16	84.0
Delaware	22	1,255,000	69.0	1,458,000	19	56.6
District of Columbia	17	1,865,000	97.2	1,873,000	16	91.6
Florida	63	4,279,000	81.8	5,268,000	55	63.8
Georgia	74	3,347,000	33.2	3,347,000	51	28.6
Hawaii	11	1,512,000	80.8	1,824,000	10	70.9
Idaho	68	2,908,000	64.8	2,962,000	68	64.8
Illinois	162	9,474,000	53.9	9,474,000	121	43.1
Indiana	34	3,544,000	35.3	3,549,000	25	22.7
Iowa	138	7,136,000	71.0	7,621,000	130	67.5
Kansas	235	10,090,000	100.0	10,528,000	235	100.0
Kentucky	121	4,902,000	65.2	4,902,000	88	52.4
Louisiana	50	3,297,000	56.6	3,804,000	31	40.1
Maine	151	2,695,000	80.0	2,785,000	148	77.8
Maryland	25	1,109,000	31.1	1,123,000	20	28.0
Massachusetts	34	4,884,000	74.0	5,286,000	33	72.2
Michigan	168	9,145,000	71.8	9,196,000	145	60.6
Minnesota	231	6,672,000	62.6	6,752,000	221	60.4
Mississippi	77	2,891,000	41.4	4,656,000	59	30.4
Missouri	206	8,682,000	71.3	9,203,000	184	64.0
Montana	85	5,355,000	72.0	5,535,000	73	68.4
Nebraska	147	6,380,000	81.5	7,653,000	138	78.1
Nevada	24	2,530,000	55.7	2,530,000	24	55.7
New Hampshire	37	1,561,000	81.7	1,587,000	34	77.7
New Jersey	29	3,259,000	51.4	3,259,000	26	48.9
New Mexico	88	4,286,000	74.0	4,287,000	81	71.9
New York	221	20,606,000	92.3	22,479,000	213	86.3
North Carolina	119	3,652,000	38.4	4,613,000	97	30.6
North Dakota	136	2,923,000	50.4	3,036,000	115	40.0
Ohio	267	11,725,000	75.7	12,082,000	221	63.8
Oklahoma	88	4,834,000	52.4	4,834,000	72	43.6
Oregon	123	5,203,000	85.2	5,389,000	94	72.7
Pennsylvania	492	15,025,000	79.5	15,100,000	453	67.6
Rhode Island	22	1,473,000	73.7	1,473,000	20	69.8
South Carolina	78	3,557,000	65.2	3,560,000	74	63.2
South Dakota	87	2,845,000	47.3	2,983,000	77	40.9
Tennessee	77	4,719,000	55.6	5,295,000	54	37.6
Texas	410	14,458,000	59.6	17,870,000	343	51.1
Utah	88	3,512,000	83.7	3,522,000	83	78.7
Vermont	50	1,527,000	81.8	1,570,000	48	78.4
Virginia	148	5,017,000	67.6	5,161,000	96	44.1
Washington	95	5,209,000	85.2	5,227,000	83	78.5
West Virginia	66	2,750,000	61.5	2,774,000	63	59.0
Wisconsin	126	6,059,000	62.3	6,129,000	117	59.8
Wyoming	93	3,449,000	76.6	3,713,000	80	66.9
Totals	5,456	$259,044,000	65.7	$282,230,000	4,733	57.5

Force Account Work Included in Advertised: P.W.A. Funds—$20,186,000; Estimated Total Cost—$20,464,000; Number of Projects—854.

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one on "Open Price Policy—Uniform Cost Accounting—Uniform Terms of Sale—Uniform Credit Practices" and the other on "Function of District Committees, Regional Committees, Division Committees and the Code Authority in the administration of the Code." The evening was devoted to six group meetings, at which were held round table discussions of certain code provisions. Thursday afternoon was given over to three independent sessions. On Thursday evening was held a joint banquet of the three associations.

Never before has such a meeting of the Crushed Stone, Sand and Gravel and Slag industries been held. Never, in the past, has such a large group of men tackled a problem with such serious intent and so effectively.

The following officers were elected: National Crushed Stone Association —President, Russel Rarey, Marble Cliff Quarries Company, Columbus, Ohio; Regional Vice-Presidents, Arthur S. Lane, Eastern Region; A. B. Mack, Central Region; T. I. Weston, Southern Region; E. Eikel, Southwestern Region; W. R. Sanborn, Northern Region; Porter W. Yett, Northwestern Region; C. M. Doolittle, Canadian Region; A. J. Wilson, Western Region, Chairman.

National Sand and Gravel Association—H. V. Owens, President (re-elected); G. W. Renwick, Vice-President, H. S. Davison, Treasurer. Executive committee: Paul P. Bird, Boston, Massachusetts; Alexander Foster, Jr., Philadelphia, Pennsylvania; M. A. Neville, Lafayette, Indiana; Lee T. McCourt, Memphis, Tennessee.

Civil Engineers Meet

THE EIGHTY-FIRST annual meeting of the American Society of Civil Engineers was held in New York January 17 to 20. Development planning and the governmental operation of utilities were the principal subjects of discussion. Harrison P. Eddy of Boston was elected to the presidency to succeed Alonzo J. Hammond.

Ceramic Convention February 11

THE AMERICAN CERAMIC SOCIETY will celebrate its thirty-fifth anniversary at its convention in Cincinnati on February 11th to 16th in the Netherland Plaza Hotel.

U. S. Engineers Budget $30,940,000

FOR the fiscal year from June 30, 1934 to June 30, 1935 the U. S. Engineers expect to spend on river and harbor work $30,940,000. Congress has asked for a new appropriation of $25,000,000 while $5,940,000 is available from appropriation made under the previous budget.

Mississippi River flood control will require $7,054,000 of which $532,000 will go for the Lower Mississippi and $6,522,000 for the Middle and Upper Mississippi. This includes work on the tributaries, there being $3,032,000 on the Mississippi, $2,000,000 on the Missouri and $1,337,000 for open channel work on the Ohio.

Rivers and harbors on the Atlantic coast are expected to cost $8,048,000 which includes $2,000,000 for the Delaware River below Philadelphia.

The Gulf Coast is to get $3,550,000 including approximately $500,000 each for the Southwest Pass on the Mississippi, the Sabine-Neches Waterway and Houston Ship Channel.

The Pacific Coast schedules calls for $3,205,000 including $374,000 for San Diego Harbor, $610,000 on the mouth of the Columbia and $685,000 for work on the Columbia and lower Willamette river below Vancouver and Portland.

Intracoastal Waterway is scheduled for $1,477,000 including $300,000 for the Chesapeake-Delaware waterway, $200,000 for work between Jacksonville and Miami, with $235,000 in the Louisiana-Texas waterway.

Work on the Great Lakes is expected to total $2,231,000. Work being carried on in the Detroit River will require an additional $2,547,000 but this is included as a separate item and is not in the $30,940,000 total. The same applies to various projects financed by funds from the Public Works Authority which are being carried out by the U. S. Engineers but are not included in the regular river and harbor program.

1st Operator—"The girl I married has a twin sister."

2nd Operator—"Gee! How do you tell them apart?"

1st Operator—"I don't; it's up to the other one to look out for herself."

Contractor: "You take accounting at college, don't you?"

Son: "Yes, sure."

Contractor: "Maybe you can account for the silk undies in your last laundry?"

Status of Public Works Highway Program

THE following tabulation shows the number of N.R.A. Federal Aid projects advertised for contract, the estimated cost of these projects, the percentage of state allotment represented by this estimated cost including funds furnished from other sources than P.W.A., the number of projects awarded and the percentage of allotment awarded as of January 13th. The tabulation is prepared from information furnished by the Bureau of Public Roads. The figures in this table include both force account and contract work.

State	Number of Projects Advertised	Work Advertised P.W.A. Funds	Percentage of Allotment	Estimated Total Cost	Number of Projects Awarded	Percentage of Allotment Awarded
Alabama	57	$3,549,000	42.4	$6,094,000	46	34.7
Arizona	37	3,558,000	68.3	4,148,000	28	57.5
Arkansas	65	2,241,000	33.2	2,804,000	49	27.7
California	118	11,711,000	75.0	15,352,000	94	62.0
Colorado	79	3,667,000	53.3	3,667,000	62	47.1
Connecticut	17	2,717,000	94.8	2,893,000	16	84.0
Delaware	22	1,255,000	69.0	1,458,000	19	56.6
District of Columbia	17	1,865,000	97.2	1,873,000	16	91.6
Florida	63	4,279,000	81.8	5,268,000	55	63.8
Georgia	74	3,347,000	33.2	3,347,000	51	28.6
Hawaii	11	1,512,000	80.8	1,824,000	10	70.9
Idaho	68	2,908,000	64.8	2,962,000	68	64.8
Illinois	162	9,474,000	53.9	9,474,000	121	43.1
Indiana	34	3,544,000	35.3	3,549,000	25	22.7
Iowa	138	7,136,000	71.0	7,621,000	130	67.5
Kansas	235	10,090,000	100.0	10,528,000	235	100.0
Kentucky	121	4,902,000	65.2	4,902,000	88	52.4
Louisiana	50	3,297,000	56.6	3,804,000	31	40.1
Maine	151	2,695,000	80.0	2,785,000	148	77.8
Maryland	25	1,109,000	31.1	1,123,000	20	28.0
Massachusetts	34	4,884,000	74.0	5,286,000	33	72.2
Michigan	168	9,145,000	71.8	9,196,000	145	60.6
Minnesota	231	6,672,000	62.6	6,752,000	221	60.4
Mississippi	77	2,891,000	41.4	4,656,000	59	30.4
Missouri	206	8,682,000	71.3	9,203,000	184	64.0
Montana	85	5,355,000	72.0	5,535,000	73	68.4
Nebraska	147	6,380,000	81.5	7,653,000	138	78.1
Nevada	24	2,530,000	55.7	2,530,000	24	55.7
New Hampshire	37	1,561,000	81.7	1,587,000	34	77.7
New Jersey	29	3,259,000	51.4	3,259,000	26	48.9
New Mexico	88	4,286,000	74.0	4,287,000	81	71.9
New York	221	20,606,000	92.3	22,479,000	213	86.3
North Carolina	119	3,652,000	38.4	4,613,000	97	30.6
North Dakota	136	2,923,000	50.4	3,036,000	115	40.0
Ohio	267	11,725,000	75.7	12,082,000	221	63.8
Oklahoma	88	4,834,000	52.4	4,834,000	72	43.6
Oregon	123	5,203,000	85.2	5,389,000	94	72.7
Pennsylvania	492	15,025,000	79.5	15,100,000	453	67.6
Rhode Island	22	1,473,000	73.7	1,473,000	20	69.8
South Carolina	78	3,557,000	65.2	3,560,000	74	63.2
South Dakota	87	2,845,000	47.3	2,983,000	77	40.9
Tennessee	77	4,719,000	55.6	5,295,000	54	37.6
Texas	410	14,458,000	59.6	17,870,000	343	51.1
Utah	88	3,512,000	83.7	3,522,000	83	78.7
Vermont	50	1,527,000	81.8	1,570,000	48	78.4
Virginia	148	5,017,000	67.6	5,161,000	96	44.1
Washington	95	5,209,000	85.2	5,227,000	83	78.5
West Virginia	66	2,750,000	61.5	2,774,000	63	59.0
Wisconsin	126	6,059,000	62.3	6,129,000	117	59.8
Wyoming	93	3,449,000	76.6	3,713,000	80	66.9
Totals	5,456	$259,044,000	65.7	$282,230,000	4,733	57.5

Force Account Work Included in Advertised: P.W.A. Funds—$20,186,000; Estimated Total Cost—$20,464,000; Number of Projects—854.

Public Roads Chief Summarizes Highway Work

CONSTRUCTION actually has been undertaken in the last six months under the Federal Public Works appropriation on a road mileage sufficient to build six great transcontinental highways across the United States. This striking comparison was made by Thos. H. MacDonald, Chief of the Bureau of Public Roads, U. S. Department of Agriculture, which has the highway building in charge, in addressing the 31st annual convention of the American Road Builders' Association in Chicago.

In summarizing the work undertaken to the end of 1933 on public works highways by the States under the supervision of the Bureau of Public Roads, which covers two-thirds of the program, Mr. MacDonald reported a total of 17,647 miles of construction at an estimated cost of $273,849,184. Of these roads, 9,822 miles are on the Federal-aid system outside of municipalities, 964 miles are extension of such roads into and through cities, and 6,861 miles are secondary or feeder roads. The mileage, by types of construction, is as follows:

Type	Miles
Grade and drained	4,149
Sand clay, treated and untreated	1,128
Gravel, treated and untreated	6,291
Macadam, treated and untreated	442
Low-cost bituminous mix	1,801
Bituminous macadam	461
Bituminous concrete	706
Portland cement concrete	2,521
Block	63
2431 bridges and approaches	72
159 railroad-highway and between-highway grade separations	13

Employment of men on this program, beginning in August, reached a total of 132,000 men continuously employed in November. The total number of men employed including labor turnover was 236,000. This does not take into account the auxiliary industrial employment.

"The present public works highway program, while being carried on generally in accordance with existing Federal-aid highway legislation, has been modified by incorporating a number of important new principles," Mr. MacDonald stated. Included in the new ideas discussed by Mr. MacDonald were the payment for railroad grade crossing eliminations, thereby relieving the railroads of expense heretofore required under State laws, the discouragement of State purchases of Portland cement for highway building, the extension of main highways through cities, the improvement of secondary roads, and the landscaping of more adequate highway rights of way.

Bureau of Reclamation Activities

IN HIS annual report, Elwood Mead, Commissioner of the Bureau of Reclamation, reports that the area irrigated in 1932 by water from government works was 2,769,605 acres and the area cropped was 2,775,280 acres. The total value of 1932 crops was $50,158,381. This was a decrease of almost $24,000,000 from 1931 and over $69,000,000 from 1930, largely due to the prevailing low prices of the crops. From 1906, when water was first available, to and including 1932, crops grown on land irrigated by government works totaled $1,886,048,258. To June 30, 1933, the department had constructed 17,808 miles of canals and drains; had laid 908 miles of pipe; completed 1,498 miles of road; 120 miles of railroad; 4,086 miles of telephone lines; and 3,587 miles of transmission lines. Mr. Mead states that building these numerous canal systems has required the excavation of 319,004,119 cubic yards of earth and rock and the placing of 5,651,196 cubic yards of concrete requiring 6,502,636 barrels of cement.

U. S. Bureau of Roads Exhibits Model Roman Road

ONE of the most interesting exhibits presented at the Road Builders' convention in Chicago was a large model showing construction and traffic on the most famous road of ancient Rome, the Appian Way. This unique exhibit was prepared by the Bureau of Public Roads after thorough investigation of the design, construction and traffic of this most famous highway in history.

The Appian Way, one of the main arteries of the great system of highways that kept Rome in immediate contact with all parts of the Roman Empire, still endures after a lapse of twenty centuries. It was 16 feet wide with two foot curbs 18 inches high on both sides beyond which were 8 foot wide sidewalks. It was constructed of solid stone and concrete masonry 3 to 4½ feet thick depending on the soil over which it was laid. It was very straight with steep grades where necessary but with the curves widened as on modern roads.

In building the Appian Way a bed of sand and gravel, sometimes covered with a thin coat of lime mortar was used as a foundation for 4 layers of masonry. The first of these, from one to two feet thick, was composed of stones that would fit into a man's hand and held together with lime mortar or clay. Next came a layer of smaller stones, mixed with lime mortar and 9 inches in thickness. The third layer was of concrete made from small stones, sand and hot lime mortar and was 1½ feet thick in the center and one foot thick on the sides in order to give a proper crown to the road. The 4th or wearing layer was of polygonal stones about 3 feet in diameter and 6 inches thick laid with close joints. This upper surface of wearing stones was dressed smooth and the joints fitted so tightly as to be scarcely discernible.

Construction of the type used in the Appian Way would be regarded as extremely wasteful today and would cost approximately six times as much as our fine motor highways for heavy traffic. The fundamental difference between the ancient Roman road and our modern pavements is that the present day engineer relies upon the soil to bear the load, the pavement acting as a wearing surface and a roof to protect the supporting subgrade soil. The Romans relied solely on massive construction.

Death Strikes Six Companies' Head

E. W. Wattis, 78, 3rd President of Six Companies, Inc., died unexpectedly at his home in Ogden, Utah, February 4 of heart disease. Mr. Wattis succeeded W. A. Bechtel who died recently (August 28) in Russia. Mr. Bechtel had followed W. H. Wattis, 1st President of Six Companies, who died September 13, 1931.

American Engineering Council Elects New Officers

JOHN F. COLEMAN, Consulting Engineer of New Orleans, Past President of the American Society of Civil Engineers, was elected President and Frederick M. Feiker, formerly Director of the Bureau of Foreign and Domestic Commerce, was appointed Executive Secretary of the American Engineering Council at the annual meeting held in Washington, January 11, 12 and 13. Other officers were elected as follows: For Vice Presidents of the Council, C. O. Bickelhaupt, Vice President of the American Telephone and Telegraph Company, New York, representing the American Institute of Electrical Engineers; Paul Doty, Consulting Engineer, St. Paul, representing the American Society of Mechanical Engineers; A. J. Hammond, Consulting Engineer of Chicago, representing the American Society of Civil Engineers; W. H. Woodbury, Duluth, representing the local engineering societies. C. E. Stephens of the American Institute of Electrical Engineers was elected Treasurer and William McClellan, President of the Potomac Electric Power Company of Washington, was elected Chairman of the Finance Committee.

Retiring President, W. S. Lee of Charlotte, North Carolina, in his opening address called attention to the thirteen years of development of the American Engineering Council pointing out that to its deeper purpose of serving the public, there had been brought together in counsel scores of leaders in the industrial, engineering and public utility fields as well as those

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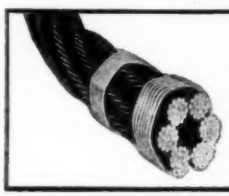

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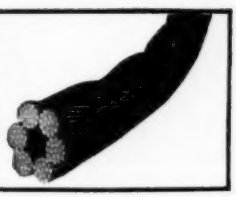

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Shots From the Firing Line— *Continued*

representing municipal, state and federal bodies.

He pointed out that nearly three-quarters of a million dollars had been spent to prosecute the public good, through the work of the council, including some $90,000 for direct research into the engineering values of public and private engineering enterprises.

Michigan Secretary of AGC Pans CWA Inefficiency

By CLYDE B. DAVIS

IN AN attack on work in Michigan under CWA management, E. J. Brunner, secretary-manager of the Associated General Contractors, declares:

"So much red tape surrounds the PWA program that Michigan with its hidebound constitutional restrictions got only a niggardly supply of funds. . . . Now comes CWA and funds that would have been given under PWA, which permits contract work or supervision, are allotted under CWA, under which contract work or supervision are not permitted. The funds are given outright and are easier to get. There is no loan to be repaid at the expense of the taxpayers. The theory of providing for every type of worker is right and laudable but between the PWA and the CWA the contractor is only a loser, at least in Michigan."

Mr. Brunner cites instances of CWA waste which could not have happened under supervision of a contractor. He states that, on Livernois Avenue, Detroit, 200 men were shoveling out enough dirt to permit a new pavement 9 inches deep. Many of them dug until they were waist deep and the ditch had to be filled in and packed.

On Beech road 300 men were digging a ditch. They had cleaned it out a half mile Mr. Brunner claims, when it was found specifications called for moving the ditch over 12 feet and filling in the one they were cleaning. The ditch was moved, when it was found they lacked a foot of moving it far enough.

He tells about an addition to a schoolhouse at Big Rapids where men excavating made no provision for supporting the walls of the existing building. A pupil in class noticed a crack developing in a wall. He notified a teacher barely in time for her to lead out the class and warn the men at work before almost the entire building collapsed into the partially completed excavation.

He called attention to other instances, some of which the newspapers have published, and continued:

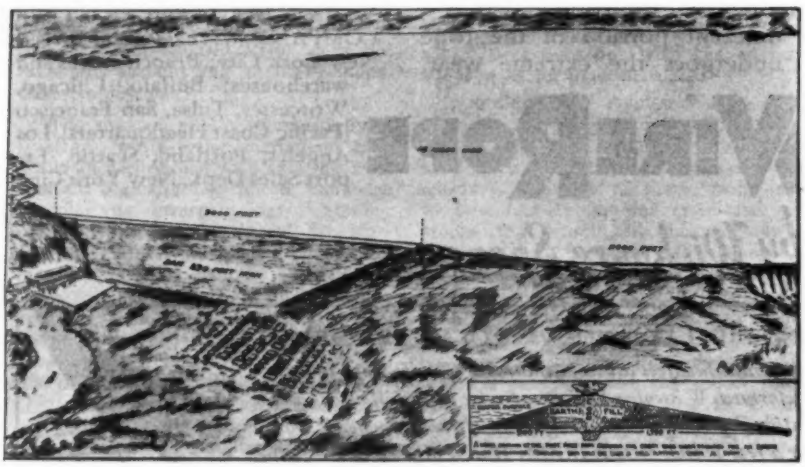
"Because of inefficiencies, CWA is spending twice as much for the work as would be spent if contractors were given it to do. Consequently the funds are not going as far as they might."

Above is illustrated the site of the Fort Peck Reservoir Storage Basin, shortly before the first snow fall. Down in the valley and dwarfed by the immensity of the landscape are men and teams moving timber, fences and homesteaders' cabins. The Missouri River, low at this season can be seen cutting across the center of the Valley.

Canadian Constructors Meet

THE SIXTEENTH ANNUAL convention of the Canadian Construction Association was held at the Royal York Hotel in Toronto during the week of January 22. Speakers included Floyd S. Chalmers, Editor of the Financial Post of Toronto, who talked on "Highways of Recovery;" Tom Moore, President of the Trades and Labor Congress of Canada, whose subject was "Organized Labor's Viewpoint on Unemployment Insurance." President C. J. A. Cook delivered the annual address and General Manager J. Clark Reilly presented an excellent report of the year's activities. The activities of the National Construction Council were reported by George Oakley, its chairman. W. D. Black of the Otis-Fensom Elevator Company of Hamilton, spoke on "Intelligent Planning for the Future by the Construction Men of Canada." Bert Trestrail of Toronto discussed "Inflation." Francis Hankin of Montreal was a chief speaker at the annual banquet, his subject being "Relations Between Business and Government in Canada." Professor Gilbert E. Jackson of the University of Toronto discussed "Recovery by Construction."

Good Roads Week will be celebrated in Ontario on February 19, 20, 21, and 22. This is the occasion of the Conference of the County and Township Road Engineers and Superintendents, followed by the annual convention of the Ontario Good Roads Association.



This rough sketch, the first engineer's drawing released, shows the preliminary plan of the great earth-filled dam, at Fort Peck.

New England Notes

Operator Louis Williams is now located at Canton, Massachusetts, where he is operating a Bucyrus-Erie 43-B for Arute Brothers.

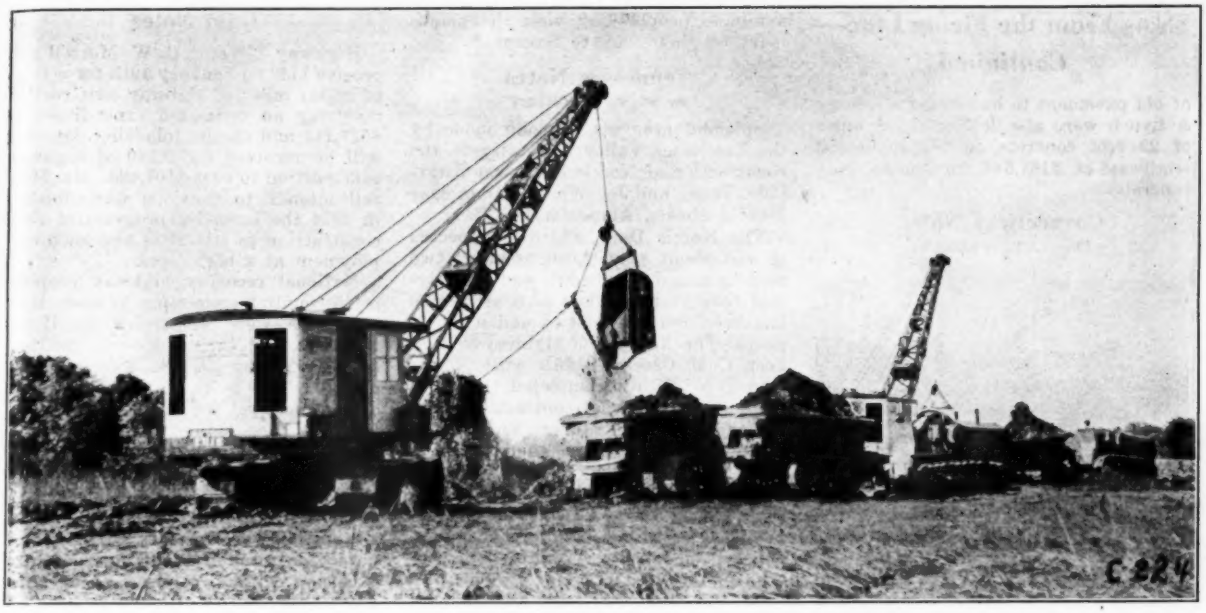
Pennsylvania Notes

D. L. Dennis has two shovels on Pinchot roads in Potter County.

Andrews Construction Company of Tyrone has 10,000 yards of excavation and a girder bridge Coudersport Borough.

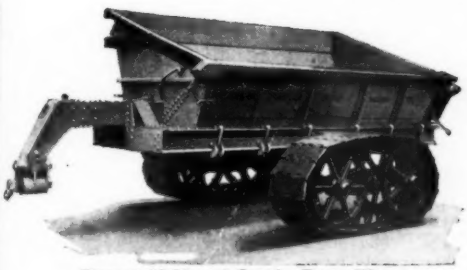
Delaware Notes

Delaware State Highway Department awarded, on January 17th bidding, contract for 4.224 miles of dual road of 20 foot concrete from Dover to Bishop's Corner to **George & Lynch** of Dover at $198,875. The work includes 38,000 cubic yards of hand excavation; 25,000 cubic yards of machine borrow; 115,000 square yards of top soil; 14,000 cubic yards of concrete pavement; and 2,800 square yards



Between May 26 and Nov. 15, Shaw Construction Company's six 10-13 yard Western wagons moved 975,000 cu. yds. in levee work, average haul 750 ft.

26 Cubic Yards Each Trip With Western Crawler Wagons



Western 10-13 yard Crawler Dump Wagon

THAT is the kind of work that gives a profit for the contractor. Western wagons are built for such heavy work.

The light running Western Crawler Wheels on which these wagons are mounted are self-cleaning, have replaceable tires on the track wheels and are ***built for hard usage at their rated capacity***.

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Shots From the Firing Line— *Continued*

of old pavement to be removed. George & Lynch were also low on 1.799 miles of 22 foot concrete on the Industrial Highway at $161,544 for central mix concrete.

Connecticut Notes

By J. R. PARKER

Edward Balf Company of Hartford, Connecticut, use these two Bucyrus-Erie steamers to move 20,000 yards on the Farmington Avenue, Hartford, job.

North Carolina Notes

The State Highway Commission held a letting on January 9th which involved about 40 miles of bituminous surface treatment; 8 miles of sand asphalt construction; 8 miles of grading, structures and top soil construction and several other municipal projects, most of which was the widening of present pavements inside of incorporated towns to eliminate congestion. This letting involved approximately $400,000 worth of work.

According to John D. Waldrop, State Highway Engineer, **a letting on January 30th** will involve $800,000 worth of work, a large majority of which is in connection with municipal projects to be built under the U. S. Public Works Program. An additional letting will be held about February 15th involving about $500,000 or $600,000 worth of work and Mr. Waldrop expects to continue to hold these lettings as fast as possible until all of the U. S. Public Works funds allocated to this State have been placed under contract.

Georgia Notes

The old splendor of **Fort Pulaski, in Fort Pulaski National Monument, Georgia,** will be restored under an allotment of $153,500 from Public Works funds. It is now inaccessible to the average person, and a trip around the fort is practically impossible. To remedy this $10,000 has been allotted for building wharves and $50,000 for road work. With boat landing facilities available people may visit the monument on their way to Savannah.

Tennessee Notes

By W. W. WHORLEY

Splendid progress is being made by the Tennessee Valley Authority on the construction of Norris Dam near Knoxville, Tenn., and Joe Wheeler Dam near Muscle Shoals, Alabama.

The Norris Dam, which is expected to cost about $34,000,000, is about two months ahead of schedule and the original four year schedule of construction has been reduced to two and one-half years. The heavy duty highway to connect Coal Creek, Tenn., with Norris Dam is practically completed, this work having been done by contract by **Boxley and Bray** of Roanoke, Virginia.

Approximately three thousand men are being employed jointly under the TVA and CWA at the Norris Dam town site in addition to the large number working at the dam site under the supervision of Ross White, Superintendent of Construction.

At Joe Wheeler Dam in northern Alabama the first unit of the cofferdam extending 1400′ out from the south bank and 400′ wide has been completed and excavation for the power house site has been started. This work is under the supervision of Wilfred M. Hall, Engineer in Charge and Lee H. Huntley, Construction Superintendent. In addition to this a large crew is engaged in building a camp nearby under the supervision of the Land Planning and Housing Department of TVA.

C. H. Locher, who is well known as an eminent authority on various types of heavy construction work, is construction consultant for the TVA.

Mississippi Notes

By ERNEST W. FAIR

Contracts were awarded on January 6th by the State Highway Department for the following projects and to the following contractors: On U. S. 51 in Panola County, grading and drainage 2.786 miles to **Mike Harvey** of Sardis for $34,512; on U. S. 49 in Forrest County, 15,331 miles grading and drainage for $232,639 to **A. Guthrie** of St. Paul, Minnesota and on U. S. 49E in Tallahatchie County, to **Dunn Construction Company** of Jackson.

Other awards were: to **A. Guthrie** of St. Paul, 10 miles grading and drainage on U. S. 11 in Lamar County, highway construction on U. S. 80 in Rankin County to **Cobb Brothers Construction Company** of Meridan, on State Highway 24 in Marion County for grading and drainage to **T. L. James and Company** of Ruston, Louisiana; on State Highway 15 in Newton County, construction to **Carey-Reif Company** of Lexington, Kentucky; on State Highway 16 in Neshoba County, eleven miles grading and surfacing to **Clark, Kearney and Stark** of Hazelhurst and on State Highway 63 in Green County drainage and bridge construction to **W. C. Howton** of Birmingham.

Ohio Notes

Highway Director O. W. Merrell will receive bids on **January 19th for a total of 22.711 miles of highway construction involving an estimated expenditure of $621,111 and on the following day bids will be received for 3.580 of highway construction to cost $107,488. Mr. Merrell intends to continue undiminished in 1934 the intensive program of road construction to stimulate and keep employment at a high level.**

National recovery highway projects in 25 counties amounting to more than $1,500,000 were announced by Highway Director O. W. Merrell for letting on Friday and Saturday, Feb. 9 and 10. This is the largest awarding of contracts yet scheduled by the State Highway Department under the NRA fund grant. Total construction mileage involved is 35.982. Projects in 21 counties involving 27.084 miles and an estimated expenditure of $1,158,099 are included in the Feb. 9 sale. Proposals on total of 8.898 miles of construction in four counties at an estimated expenditure of $401,544.33 are included in the Feb. 10 letting.

Initial distribution of fees collected by the Bureau of Motor Vehicles in the issuance of 1934 auto licenses was announced today by Glen M. Daily, State Registrar of Motor Vehicles. This advance distribution amounts to $6,076,809. The share going to the 88 counties of the state is $3,623,559, while $1,925,250 is being distributed to the districts of registration, including municipalities, representing 25 per cent of the total motor vehicle taxes collected by these districts. Each county is also receiving $6,000 out of the 5 per cent equalization license fee fund of $528,000.

Cuyahoga County is the largest sharer in the license fee distribution. Its share is $1,029,960. Other counties receiving large amounts are: Hamilton, $547,992; Franklin, $334,728; Lucas, $325,944; Summit, $307,440; Montgomery, $283,392; Stark, $171,432; Mahoning, $168,264.

Cleveland receives the largest amount of the motor vehicle tax accruing to Ohio cities. It will get $249,250 of the tax distribution to Cuyahoga county. Amounts to be received by other leading Ohio cities are: Cincinnati, $145,750; Toledo, $97,500; Columbus, $95,750; Akron, $83,750; Dayton, $60,000; Canton, $28,750.

Eighty-seven NRA highway projects employing 5,185 men were under construction throughout Ohio during December, Highway Director O. W. Merrel reported to Governor White. Workers, both skilled and unskilled, on these projects were paid a total of $143,146, with a small portion of the money being obligated for team hire and equipment rentals. The 87 projects in progress included NR secondary jobs which were going forward under contract the same as regular NRA highway and NRA municipal highway projects.

This report, however, does not cover the employment of some 4,000 men on

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Shots From the Firing Line—*Continued*

NR secondary projects which were under construction by force-account. An average of about 28,000 men also worked on CWA highway projects which are under the supervision of the State Highway Department during December. As high as 32,700 men were at work on CWA highway improvements, but bad weather conditions interfering with work on some days kept the average for the month down.

Michigan Notes

By CLYDE B. DAVIS

Under an agreement reached by the State Highway Department and city officials, Detroit took over Jan. 1 maintenance of state trunk lines previously under the Wayne County Road Commission. Under this plan city employees who have given years of service but were laid off, will be put back to work. The state highways are adjacent to other streets maintained by the city and it is believed an economy will be effected, since the city has all necessary equipment near at hand. The State estimates the year's work within the city at $180,000 and will turn over that amount direct to the city.

Eight pumps discharging 129,000 gallons of water a minute in **Section D of the Livingstone Channel** opposite Bob-Lo Island since Dec. 1 have made little progress in drying up that section for cofferdam work. Workmen say this is due to leaks and to springs, but Maj. R. C. Crawford, U. S. district engineer, says not enough water has been pumped out to enable anybody to see any springs and has not made up his mind as to the cause of the trouble. One-third of the channel job has been completed since last Aug. 1.

Bids are to be sought soon for the river dredging job at Saginaw, approved the last week in December, and work is expected to start with opening of the navigation season.

The Federal government will spend more than $8,000,000 this year in channel improvements from St. Mary's River to the Detroit River. Congress will be asked to appropriate $3,775,000. The remainder, $4,574,300, already has been allotted by the PWA to projects in the Detroit district. Continuance of improvements in the Detroit river channels is the largest of the projects, nearly $7,000,000. In addition, nearly $2,400,000 is being spent in St. Clair River.

Construction has been started on a $110,000 grade separation at US12 and the Michigan Central tracks at the east city limits of Ypsilanti. Other jobs under construction include: Grand Traverse County, 2.5 miles grading, Peninsula road, **Pickett & Goodwin**, Allegan, $25,078; Montmorency County, 6 miles grading and gravel on non-trunk line north of Hillman, **William G. Gilliland**, Alpena, $55,682; Osceola County, 6 miles grading and gravel M61 between Marion and Tustin, **William G. Gilliland**, $62,742; Keweenaw County, 3.8 miles grading, M129 Eagle Harbor to Copper Harbor, **Thornton Bros.**, Hancock, $28,811; Oscoda County, 5.8 miles grading and gravel, M72 Mio to Kneeland, **William G. Gilliland**, $53,895.

Illinois Notes

By H. H. BUCHANAN

Operator Buell Black of Jacksonville, sent us the above snapshot of a Bucyrus-Erie D-2 loading rock from Gibsonia Hill in Gallatin County. Mr. Black was just back from finishing up this job which **Krueger Construction Company and Gund-Graham** put through in Hardin and Gallatin Counties. Work was started in October, 1932, and finished December 17, 1933. Mr. Black tells us that it made some splendid records with the D-2 and at the finish ran straight through 29 ten-hour days without a delay and loaded approximately 33,000 yards in the 29 days. Of this 800 yards was solid rock, 2300 yards loose rock and 29,800 yards dirt. Says Mr. Black, "We think that was some run for a 4-year old machine that hasn't had $25.00 for repairs on the Atlas engine since it came out." The particular cut shown took about six weeks' work and runs 21 feet to grade. The bridge over Eagle Creek is just beyond the cut in the background. They had a hard time keeping the wagons under this Bucyrus-Erie Diesel and here Mr. Black is all set and waiting for the next one.

Bids were received at Springfield, January 26th for ten paving jobs totaling 16.44 miles, 2 grading jobs with 97,790 yards of excavation, 7 bridge and overhead jobs.

South Dakota Notes

By PAUL G. FRIGGENS

Highway construction work in 20 counties at a cost of approximately **$400,000 is the schedule** of the South Dakota State Highway Commission for its first January letting here January 25th. Three bridges, 43,700 feet of guardrail and 75 miles of oil, gravel, concrete and grade construction are in the letting.

Kansas Notes

By ERNEST W. FAIR

Banta Construction Company were awarded 3.4 miles of earth work in Medicine Lodge, Barber County for $8,053.

J. A. Tobin and Dan Shearer of Kansas City secured 3.042 miles of the highway on U. S. 73E in Bourbon County for $106,122.

Maxwell Construction Company of Columbus were awarded 3.18 miles on 73E in Cherokee County.

Wheeler Construction Company of Clay Center secured 1.37 miles grading and concrete in Crawford County for $62,676.

Wheelock Construction Company and F. H. Freeto of Pittsburgh took a highway job in Crawford County on 73E at $61,652.

Yancey Construction Company of Abilene bid $32,676 to take 4.84 miles of grading on K18 in Dickinson County. **D. H. Hardman** of Alton secured a quarter mile in Greeley County on K27. **M. W. Watson** of Topeka secured a highway job in Hamilton County.

St. Louis and Vicinity

By A. J. KOENIG

The contract for the construction of two locks for the proposed dam at Alton, Illinois was awarded to the **John Griffith & Son Company** of Chicago. Their bid of $3,194,702 was slightly under the government estimate. Officials of the Griffith Company have inspected the district preparatory to beginning work on preliminaries. Sheds and other buildings must be constructed to house tools and equipment of the Company. It was announced that the concern expects to employ all but keymen from Madison and St. Charles county. The work is to be finished in about two years.

Bids were rejected by the Board of Public Service at St. Louis for the construction of a section of a down-town relief sewer on the recommendation of the P.W.A. engineer for the State. The low bid, $29,950 by the Samuel Kraus Company was 93% above the City Engineer's estimate. Five other bids received all ranged around the $30,000 figure. This was the first letting on sewer work since the passage last autumn of an ordinance requiring payment of union wages on all city construction.

The Illinois State Highway contracts **awarded** in December amounted to $3,108,714. Seventy-four projects including 17 bridges were involved.

Vincennes Bridge Company were awarded contracts for two bridges in Lawrence county, two in Franklin county and one in St. Clair county. **Birt Brothers** have paving jobs in Douglas, Moultrie and Coles counties. **Darrow & Barron** have contract for grading in Grundy county. **S. J. Grove & Sons Company** have a paving job in Saline county, a gravel job in Pulaski county and a bridge in St. Clair county. **Richardson Construction Company** have contract for a bridge in Madison county. **Geneva Construction Company** have a nice gravel job in Jersey county.

Bids were received January 5th for the construction of Lock 18, on the Mississippi River about seven miles

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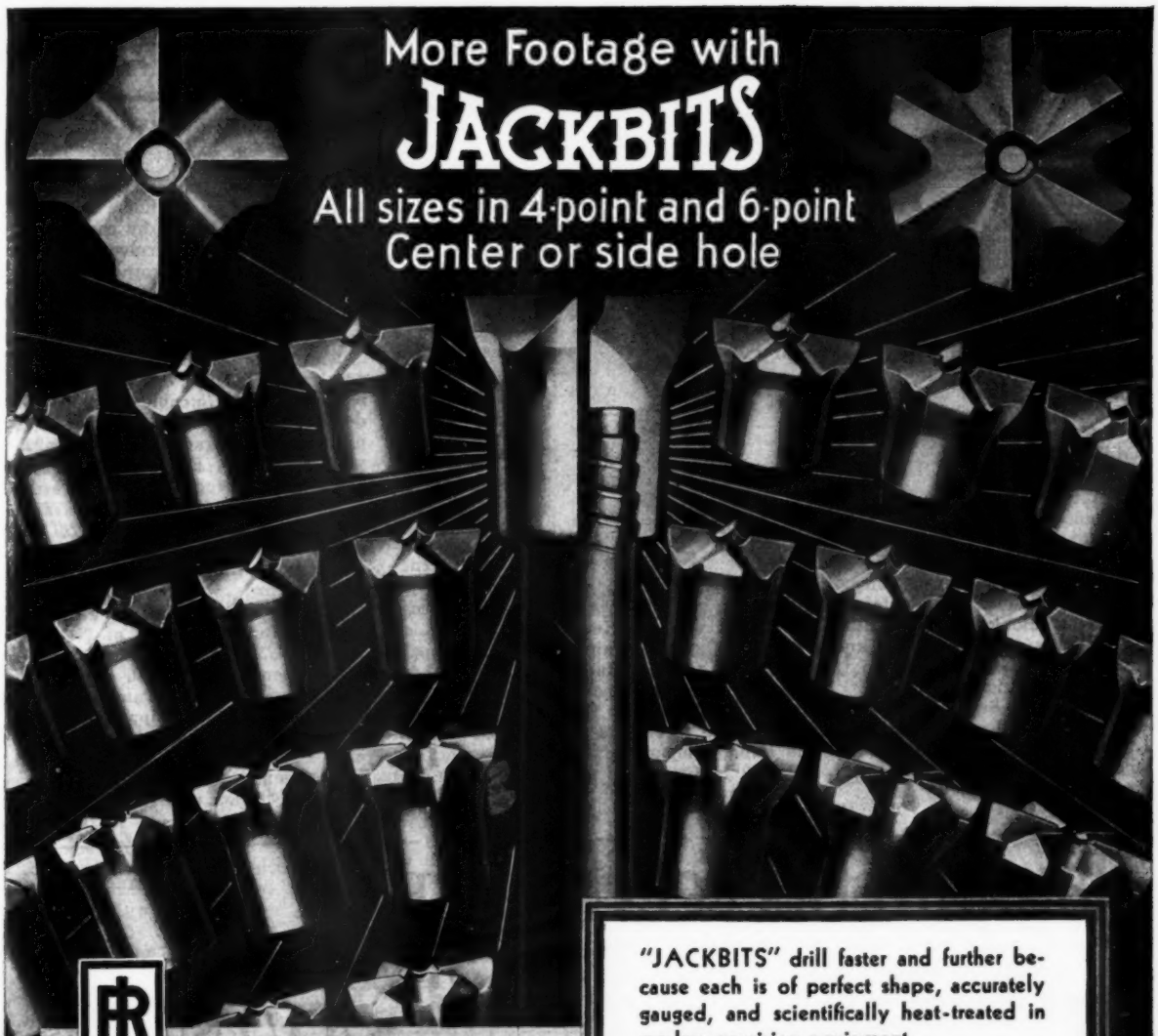

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Shots From the Firing Line— *Continued*

upstream from Burlington, Iowa. Eleven bids were opened at the letting. **Maxon Construction Company** of Dayton, Ohio were the low bidders. Their bid of $1,344,429 is about 3% under the engineer's estimate.

Warner Construction Company was low bidder at the letting for the construction of Lock No. 11 at Dubuque, Iowa. Their bid was $1,437,811. The U. S. Engineers estimate was $1,580,-651.

Bids will be opened on January 23rd for the construction of **Lock 12 at Bellevue, Iowa**; and on January 30th for the construction of Lock No. 10 at Guttenberg, Iowa. Letting will be held at the U. S. Engineers office at Rock Island, Illinois.

J. A. Tobin Construction Company and Dan Scherrer were awarded contract for the construction of a steel deck girder span viaduct on Seventh Street Trafficway, Kansas City, Kansas. The viaduct will extend from Southwest Boulevard to Humboldt Road, across the Missouri, Kansas & Texas Railway and the Frisco tracks. The contract price is $266,924.

The city of **Savanna, Illinois** will take bids on February 15th for water system, including mains, gunite and concrete roof on present reservoir. Estimated cost $72,000.

J. Meltzer Incorporated were awarded contract by the War Department for the construction of Lock No. 22 on the Mississippi River near Saverton, Missouri. The bid price was $1,-199,452.

Davis Construction Company Incorporated have contract for the construction of 10.8 miles 20 foot concrete road route 19, Montgomery county, Missouri. **T. J. Morris** was low bidder on 6.825 miles of graded road in Daviess county.

The Missouri State Highway Commission is receiving **bids on seventy highway projects** on January 19th. The letting involves 34 gravel projects, 19 graded earth, 13 concrete and 4 bridge and culvert sections.

Arkansas Notes

By ERNEST W. FAIR

Recently completed highway jobs include: Batson Brothers, Dardanelle job grading and drainage structures in Cross County; L. O. Braydon of Dyersburg grading and drainage structures in Miller County; Fred Luttjohann of Topeka bridges on 32 in Cross County; A. C. Kennedy of Little Rock grading and drainage on 71 in Little River County; Hartman-Clark Brothers Company of Peoria job in Johnston County; Ben M. Hogan of Little Rock job in Sebastain County; D. B. Hill and Company of Little Rock work on 18 in Craighead County; Deloney and Tatum of Debach work on 67 in Saline County; S. E. Evans of Fort Smith was awarded contract for 13 miles of work in Cross County on 39 and 42.

OTTO J. BAMBACK

The body of Otto J. Bamback, 45 years old, and widely known Arkansas contractor was found December 31st in the garage at his home in Rogers. His death was caused by carbon monoxide gas. He is survived by three daughters and two brothers.

River Notes

The U. S. Engineers Progress Report for November, 1933 shows **placement of 13,343,175 cubic yards** in levees during the month. 12,300,316 was placed by contractors and 1,042,859 yards by U. S. Engineers with hired labor. This brings the total yardage moved since June 1, 1928 to 407,771,900 cubic yards of which 388,605,020 yards was in levees below Cape Girardeau, Missouri on the main river while 19,-164,070 yards was on the tributaries and upper river. Total dredging in all districts for the month of November was 4,384,718 cubic yards.

Representatives of 40 construction companies attended the **annual business meeting of the Mississippi Valley Flood Control Branch** of the Associated General Contractors of America at the Hotel Peabody, Memphis, January 2nd. The Association now has 68 contract-

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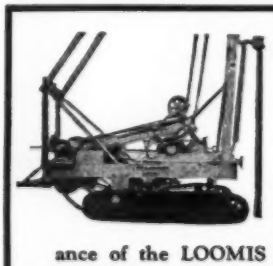

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ing firms as active members and 58 business concerns as associate members.

Elected directors at the annual meeting were five groups of contractors representing the various excavating methods. Representing hydraulic dredges are: A. Guibet, New Orleans; John H. Wilbanks, New Orleans; D. K. Woodward, Jr., Dallas. Representing tower excavators are: T. J. Clarke, Clinton; H. B. Blanks, Vicksburg; Mark C. Walker, Omaha; H. J. Sternberg, St. Louis. Tractor and wagon operations will be represented by: Walter H. Denison, Cushman; Frank Stanford, Memphis; C. B. Ford, Dyersburg; H. N. Rodgers, Memphis; J. H. Morrow, Greenville; S. K. Jones, Memphis. Representing the dike contractors are: Russell Badgett, Memphis; Lee Metcalfe, Lincoln; Harry J. Massman, Kansas City. Big boom draglines are represented by: Arthur J. Shea, Memphis; Roy L. Igo, Baton Rouge; D. D. Coleman, Memphis; J. H. Lewis, New Orleans; C. I. Jones, Baton Rouge.

The officers selected by the directors to guide the association through the coming year are: President, Frank Stanford; Roy L. Igo, H. J. Sternberg, S. K. Jones, J. H. Lewis, T. J. Clarke and Lee Metcalfe, vice-presidents; and H. N. Rodgers, secretary-treasurer. Fred D. Beneke will continue as Manager of the organization. Division and committee chairman appointed are: Bart C. Tully, chairman, Bank Protection Division; E. F. Powers, chairman, Levee Division; Frazer S. Brown, chairman membership committee; B. E. Brooks, chairman, legislative committee; D. G. Brown, chairman, finance committee.

A total of 248 attended the Association's banquet which followed the business meeting at which the President of the Mississippi River Commission and his assistants, the U. S. District Engineers at Memphis, Vicksburg, and New Orleans and their assistants were guests of honor.

Memphis

A PWA loan of $500,000 has been secured by the St. Francis Levee District of Arkansas to be used in purchasing right-of-ways. The granting of this loan is signified of what is hoped to be a precedent in PWA policy so that other levee boards will be able to borrow Government money, to clear up the right-of-way difficulties.

Pending before the PWA are applications for a $10,500,000 flood control project on the St. Francis river and a $40,000,000 levee on the White River in Arkansas.

At the letting January 3rd, bids were received by Major W. M. Hoge for **11,120,000 cubic yards of earthwork** in the Lower St. Francis, Upper Yazoo and White River districts. 23 contractors bid on the 19 jobs. 12 seem to be set for the awards but on 7 of the jobs bidders were more than 25 per cent above Government estimate and there may be some question as to whether work will be awarded, handled by Government engineers or rebid.

Low bidders who bid below or came close to the Government estimates follow: **Brooks Calloway Company** of Atlanta low on R 260 Porter Lake, Arkansas for 900,000 yards at 17 cents, L 286 Tunica, Mississippi 560,000 yards at 17 cents and L 287 at Tunica 595,000 yards at 17 cents. **Barker Brothers and W. H. Denison** of Cushman bid the low of 24.59 on 560,000 yards on R 278 at Whitehall, Arkansas and were low at 27.95 on R 342 at Countiss, Arkansas consisting of 394,000 yards. **H. E. Culbertson Construction Company** of Cleveland took L 271, 272 and 273 at Hollywood, Mississippi totaling 2,870,000 cubic yards at 16.50 **R. J. Reid and Henry Hughey** of Memphis were low at 24.00 on R 317 and 318 at Westover, Arkansas totaling 965,000 cubic yards. **Lewis Chambers Construction Company** of New Orleans were low on R 370 and 373 totaling 836,000 yards on their bid of 25.40. They were also low bidders on R 295 at St. Francis Bend, Arkansas totaling 971,000 at 23.90. This later bid was 6.3 cents above the Government estimate of 17.87. Unless Lewis-Chambers will revise their bid, the U. S. Engineers will take the job.

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Shots From the Firing Line—*Continued*

Other low bidders who may or may not receive awards include: **Edward E. Morgan** of Jackson, Mississippi on R 265 A at Council, Arkansas totaling 208,000 cubic yards bid at 31.00 against Government estimate of 28.52; **R. T. Clarke et al** of Natchez on R 265 B Council, Arkansas, totaling 158,000 yards bid at 32.20 against Government estimate of 28.52; **Clarke Brothers Construction Company** of Clinton on R 272 at Peters, Arkansas with a bid of 29.00 against Government estimate of 22.62 on 770,000 cubic yards, also R 286 at Whitehall, Arkansas where Clarke Brothers bid 29 cents against the Government bid of 21.21 totaling 790,000 yards; **Geo. W. Condon Company** of Omaha on R 381 and R 378 at Herico, Arkansas and Snow Lake, Arkansas bid 32.60 cents against the Government estimate of 25.76 for 585,000 yards on R 381 and 26.85 cents on 535,000 on R 378.

U. S. Engineers took **bids January 26th for 2,095,000 yards** in the Lower St. Francis and White River Levee Districts. Work includes 770,000 cubic yards of enlargement near Peters, Arkansas; 790,000 cubic yards of enlargement near Whitehall, Arkansas and 535 000 cubic yards of enlargement and new loop near Snow Lake, Arkansas. Contracts call for completion by December 1, 1934. A 30-hour week is specified with skilled labor at $1.00 and unskilled at 40 cents.

Tully Costello Company of Chicago and **J. L. Ward Construction Company** of Helena were tied for low at 28 cents on 182,000 cubic yards at Hickman, Kentucky, bid at Memphis, December 7th.

Final awards on the **11,200,000 cubic yards of levee** work let on January 23rd are as follows: **Brooks Calloway Company** of Atlanta 900,000 cubic yards on the Porter Lake, Arkansas job at 17 cents; 1,155,000 cubic yards on the Tunica, Mississippi job at 17 cents; **Clarke Brothers Construction Company** of Clinton 366,000 cubic yards at Council. Arkansas at 31.5 cents; **Barker Brothers and W. H. Denison** of Cushman, 560,000 cubic yards at Whitehall, at 24.59 cents, also 394,000 cubic yards at Countiss, Arkansas at 27.95 cents; **H. E. Culbertson Construction Company** of Cleveland, 2,387,000 cubic yards at Hollywood, Mississippi at 16.50 cents; **R. J. Reid-Henry Hughey** of Memphis 965,000 cubic yards at Westover, Arkansas for 24 cents; **Lewis-Chambers Construction Company** 836,000 cubic yards at Knowlton, Arkansas for 25.40 cents; **Driver Construction Company** of Driver, 585,000 cubic yards at Henrico, Arkansas for 28.80 cents. Major Hoge will readvertise 770,000 cubic yards at Peters, Arkansas; 790,000 cubic yards at Whitehall, Arkansas and 535,000 cubic yards at Snow Lake, Arkansas. The Government Engineers will take on 971,000 cubic yards at St. Francis Bend, Arkansas, which they estimated 17.87 cents per yard.

Vicksburg

The Canal Construction Company of Memphis rented their Bucyrus-Monighan 6-W to the Vicksburg engineers, and the machine is now engaged in making a channel change at Willow Point. Louisiana. The 6-W is being operated by O. V. Clifford, C. O. Dickson, W. W. Goodman, R. F. Clifford, Hank Clowers and M. H. Snyder.

New Orleans

Harris & Brandenburg and C. W. Greeson were low bidders at New Orleans on December 29th for construction of 1,600,000 cubic yards of earth work from the lower Tensas and Deer Park Bend levees. There were eleven bidders with the Harris & Brandenburg and Greeson combinations low at 18.40 cents on a proposition of all or none.

Bids for 2,000,000 cubic yards of levee work in the New Orleans district were opened January 29th. This work is on the Charenton-Intracoastal Canal Levee just east of Bayou Teche, St. Mary Parish, Louisiana. There are three sections, one of 620,000 yards of 2 to 10 foot levee, one of 740,000 yards of 5 to 13 feet and a 640,000 levee 9 to 13 feet in height. Completion dates are set as of April 30, 1935.

Oklahoma Notes

By ERNEST W. FAIR

Recently completed road jobs in the State include: by Ellis and Lewis, Incorporated of Muskogee, 1.6 miles paving and a bridge in Sequoyah County, also 4.1 miles of grade and drain on highway 51 ten miles west of Tahlequah; by F. B. Richards of Oklahoma City 1.091 miles grade and drain on highway 51 west of Tahlequah; by the Boardman Company, three bridges on 56 northeast of Wewoka; by Gibson and Gibson of Pauls Valley an underpass in Garvin County; by Luke and Company of Oklahoma City section on highway 10 in Haskell County; by Ryan-Richards of Oklahoma City 8 miles on 271 from Poteau toward Wister; Roy Tanner Paving Company of Tulsa section on 66 at Sapulpa; S. O. Maxey and Company of Durant a half mile on 77 at Ardmore; Western Paving Company a half mile on 16 in Nowata County, also 14 miles on 22 east of Duncan; Park-Ward Company of Oklahoma City five miles on 62 from Shidler east and 3 miles east of Snyder.

The B. & M. Construction Corporation of Oklahoma City were low at $68,904 and received contract for grading and paving in Tulsa.

The F. M. Spencer Construction Company received contract for construction of the new Santa Fe railroad station at Oklahoma City. Excavation has been started. R. L. Hunter, Santa Fe resident engineer is in charge. The building is expected to be completed by July.

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Louisiana Notes

J. P. HERBERT

Death came to J. P. Herbert of Breaux Bridge, January 21st, in an unfortunate automobile accident on the road between Baton Rouge and Lavonia. It was night and a cow on the highway caused the accident that resulted in Mr. Herbert's death. He was one of the most successful local contractors in the state and had done a large amount of drainage, levee and highway work. He also operated a cotton gin at Breaux Bridge. Mr. Herbert was highly regarded by all who knew him and will be sincerely missed by his many friends.

Texas Notes

By ERNEST W. FAIR

The Apex Construction Company and **Parrish and Hefferman** of Houston were awarded contract on highway 3 in Fort Bend County. They have also received contract for the Missouri Pacific underpass on 132 in Liberty County.

FRED APPEL

Fred Appel, 56, contractor and builder, met death when he fell from a scaffold on one of his construction operations. He was buried December 22nd.

H. L. Middleton, Fort Worth has announced that he will be a candidate for the Democratic nomination for governor in the forthcoming election.

New Mexico Notes

By ERNEST W. FAIR

F. M. Hayner and P. R. Burn of Las Cruces have been awarded contract for work in that city, chiefly highway surfacing.

Colorado Notes

By H. M. BIBAUD

Secretary of the Interior, Harold L. Ickes, in a conference at Washington December 29th, with Representative Edward T. Taylor of Glenwood Springs and Reclamation Commissioner Elwood Mead, stated that the **Taylor Park Dam and Reservoir** for which $2,725,000 of public money has been allocated will be built on the original site approved by settlers of the Uncompahgre Reclamation Project. Work on the 165 foot dam will be commenced as early as possible in 1934, allowing for weather conditions.

Work is going forward on the **improvement of the Dolores River road** preceding the building of the Dolores River bridge under the supervision of Clarence Mapes and the Colorado State Highway Department.

C. V. Hallenbeck of Denver was low bidder on 5.3 miles of grading on the Navajo Canyon Forest Highway in Rio Arriba County, N. M. at $101,583 according to the Bureau of Public Roads in Denver.

The Bureau also announced the bid of the **Armstrong and Armstrong Construction Company** of Roswell, N. M. of $62,159 on two miles of grading on the Carrizozo-Roswell Forest highway.

Dr. G. F. Laughlin of the U. S. Geological Survey has completed investigations for the **proposed deep drainage tunnel at Cripple Creek.** The proposal calls for a million dollar tunnel to unwater deep levels of rich producing mines where there are good values but which cannot be pumped economically. A Public Works loan would be repaid through ore proceeds.

Platt-Rogers, Inc. of Pueblo was low bidder, with an offer of $61,414 for grading 1.192 miles of State Highway 10 on the east side of Wolf Creek Pass in Mineral County. Other bidders were H. C. Lallier of Denver, $70,006 and Ward Selander of Greeley, $73,703.

A crew of men and machines are still at work on the **Old Dallas project in Ouray County** where the highway has been relocated to eliminate two railroad crossings, a bad hill, two dangerous curves and rough and boggy sections. The work started the first of September and has been a relief project with the exception of the work done by expert steam shovel operators. Superintendent of Maintenance, Joseph Shea has directed the project.

Bids on the 5.2 miles of heavy grading on the **Navajo Forest Canyon Highway** project between Espanola and Chama, N. M. were opened January

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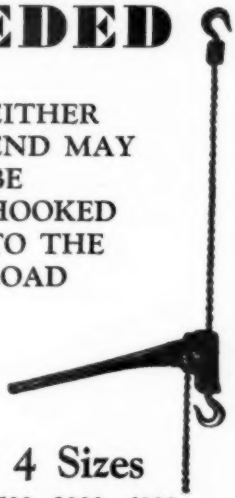
EITHER END MAY BE HOOKED TO THE LOAD



4 Sizes

1500, 3000, 6000 and 12,000 pound capacities.

BUCYRUS ERIE

Write for full particulars.

Bucyrus-Erie Company

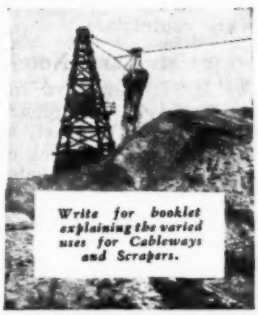
Specialty Department *South Milwaukee, Wis.*

What's Your Digging Problem?

If you have a project that calls for digging and moving materials distances of 200 to 1500 ft., it is probable that you can cut costs by using a Sauerman machine. It is just a question of which type to use—cableway or scraper.

Sauerman Slackline Cableways are in a class by themselves for work where materials must be lifted from under water and conveyed to an elevated bin, screening plant or storage pile.

Sauerman Drag Scrapers are most economical on stripping work, making fills, stock-piling and reclaiming.



Write for booklet explaining the varied uses for Cableways and Scrapers.

Sauerman Bros., Inc.

474 S. CLINTON ST. CHICAGO

Cranes Dig Faster

With WILLIAMS • BUCKETS •

Multiple-Rope, Power-Arm, and Dragline types.

We invite comparative tests because they favor the Williams.

Write for bulletins

THE WELLMAN ENGINEERING CO.

7002 Central Avenue

CLEVELAND, OHIO

Shots From the Firing Line— *Continued*

24th by the Bureau of Roads in Denver. Funds for the project amount to $95,000.

With a low bid of $82,902, **W. A. Colt and Sons** of Lyons, Colorado was awarded a contract December 19th by the Department of Interior for grading and draining 4.5 miles on the Deer Ridge-Moraine Park highway in the Rocky Mountain National Park.

The plan of borrowing $10,000,000 from PWA for Colorado highway construction was recently **vetoed by the Supreme Court** of Colorado. According to the court decision such a proposal would have to be put to popular vote before such an arrangement could be carried out.

Wyoming Notes

By PAUL G. FRIGGENS

Wyoming took bids January 23rd on **nine road projects**, three of which involve work in municipalities. The total expenditure involved in the nine projects is approximately $400,000.

Kellogg and Tree, 300 Madison Avenue, New York City, have been appointed exclusive sales agents for the products of **Diamond Iron Works, Inc.**, Minneapolis, in the New England States, New York and New Jersey. This line covers complete equipment for sand and gravel pits, including crushing and washing machines and a portable crushing and screening plant in various capacities, as well as crushers for road building, a road surfacer attachment and oil, asphalt and tar heaters for states, counties, municipalities and contractors.

Montana Notes

The U. S. Engineers on the **Fort Peck Reservoir** are reported to be working toward an early bidding on four 28-foot tunnels, each one mile in length through hard shale, a transmission line 280 miles in length and also 12,000,000 cubic-yards of earthwork.

$113,000 for a road project to facilitate travel between Glacier National Park, and its sister aCnadian park, Waterton Lakes, has been approved by Public Works Administrator Harold L. Ickes. The new road will cross the extreme northeast corner of Glacier Park for a distance of about two miles and join the Blackfeet Highway on the American side, according to Arno B. Cammerer, Director of the Office of National Parks, Buildings and Reservations, under whose supervision the project will be carried out. **On the Canadian side** the proposed highway will connect with a road in Waterton Lakes Park, construction of which was begun by the Canadian Government in 1933 as an unemployment relief measure. A section from the boundary of Glacier Park to the Blackfeet Highway will be constructed by the Montana State Highway Commission and the United States Bureau of Public Roads as a Federal Aid project. At the present time, the only route between the two parks available to motor travelers is over the prairies by way of Cardston, and the proposed road will shorten this distance by about 30 miles. It will follow Kennedy and Lee Creeks and greatly improve the opportunities for scenic enjoyment.

Oregon Notes

At the bidding January 18th, **Averill & Philpott** of Portland were awarded two bridges over the Klaskanine River in Clatsop County, on their bid of $10,475.

J. W. & J. R. Hillstrom of Marshfield secured the bridge over South Slough near North Bend on the Cape Arago Secondary in Coos County at $89,894.

United Contracting Company took 9,500 square yards of asphaltic concrete pavement on the Hood River Section of the Columbia River Highway in Hood River County for $11,650.

Mountain States Construction Company of Eugene were low on 9,000 square yards of concrete and 6,500 square yards of asphaltic concrete on the Eugene Section of the Pacific Highway in Lane County at $26,175.

J. J. Badraun of Portland bid $33,-206 to secure the bridge over the Calapooya River near Holley on the Halsey-Sweet Home Secondary Highway in Linn County.

Joseph H. Anderson of Portland was low at $17,750 on the bridge over the Mill Creek on the Beaverton-Aurora Secondary Highway at Aurora.

Theo. Arenz of Portland secured 4.2 miles of grading on the Mill City-Gates Section of the North Santiam Secondary Highway at $80,507.

Jacobsen-Jensen Company of Portland secured 1.23 miles of pavement widening and resurfacing on the Sandy Boulevard-Halsey Street Section of N. E. 82nd Avenue in the City of Portland on their bid of $67,915.

Settergren Brothers of Portland were awarded bridge over Gooseneck Creek on the Fallas-Coast Secondary Highway at Buell for $3,433.

Hart Construction Company took the Wallowa-Lostine section of the Wallowa Lake Highway consisting of 8.9 miles of regrading, surfacing and oil mat surface treatment for $83,867.

Shattuck & Neland of Portland were awarded contract for bridge over the branch of Chehalem Creek on the Yamhill-Newberg Secondary Highway at Newberg for $17,312.

Nevada Notes

The Nevada Highway Commission has awarded:

To **Utah Construction Company**, Ogden, Utah, at $107,965, 15 miles of grading and graveling between Oravada and the Nevada-Oregon state line.

To **Dodge Brothers**, Fallon, at $84,-287, 14 miles of grading and graveling in Nye County, Nevada. A second contract was also awarded Dodge Brothers at $20,620 for an overpass over the Union Pacific Railroad at Moapa in Clark County.

San Francisco and Vicinity

By H. L. LIVINGSTON

The City of Eureka voted in favor of $925,000 bonds for **improvements to the city water system.** Principal items of construction are a concrete arch dam 115 feet high above stream bed; one concrete lined tunnel, 2300 feet long, 9 feet inside diameter; and a 5-million-gallon reservoir. Application has been made to the Public Works Administration for purchase of the bonds and an additional grant of $209,000 to cover the total estimated cost of $1,134,000.

The Bechtel Company, San Francisco, have been awarded a contract in the amount of $223,623 by the Public Utilities Commission of San Francisco, for installing a 44-inch pipeline between Calaveras and the Hetch-Hetchy Aqueduct near Sunol.

The following contracts have been awarded by the California Division of Highways:

Coats Construction Company, Sacramento, $45,474 for 1.4 miles of grading and gravel surfacing between McDonald & Yorkville, Mendocino County. The roadway excavation amounts to 55,550 yards.

Macco Construction Company, $41,-686 for 2.1 miles of grading and gravel surfacing between Santa Ynez River and Santa Ynez in Santa Barbara County.

J. E. Haddock of Pasadena 3.2 miles of grading and asphalt concrete paving through Santa Barbara County at $211,514.

Griffiths Company of Los Angeles, a contract of $17,688 for 1.8 miles of grading and asphalt concrete paving in Long Beach, Los Angeles County.

Basich Brothers, Torrence, at $430,-172, 8.5 miles of grading and concrete paving in Ventura County.

The Bureau of Public Roads, San Francisco, awarded the following:

Hemstreet & Bell, Marysville, $89,913 contract for 9.2 miles of bituminous treated crushed rock base course on the General Highway, Sequoia National Park, Tulare County.

C. W. Wood, Stockton, $98,087 grading Section "A" of the Blythe-Needles Highway in Riverside.

Heafy-Moore Company, Oakland, $172,289, placing crushed rock base course on Section C and D and bituminous surface treatment on Section A, B, C and D, Route 47, of the Oakhurst National Forest Highway in Madera.

January 5th marked the **holing through** of the last section of the 28½ **mile Hetch Hetchy** Coast Range tunnel. A suitable ceremony marked this event and guests included Mayor Rossi and various engineering officials. It is expected that water from the Hetch Hetchy system will be available in San Francisco this spring. The 28½ mile Hetch Hetchy is reported as the world's longest tunnel.

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Adopt these grades on equipment exposed to low temperatures . . .

Grade 16 —For cables and open gears. A soft, very adhesive lubricant. Does not harden, crack or peel.

Grade 20 —For chain and enclosed gear drives, automotive transmissions and differentials, plain bearings and car journals. Fluid. Retains lubricating value at very low temperatures.

Grade 41 —For a wide range of medium and heavy duty enclosed gear applications, worm drives and elevator guides. Fluid.

Grade 51½-For ball and roller bearings, chassis bearings, automatic grease cups and pressure fittings. As soft a lubricant as can be made with cup grease characteristics.

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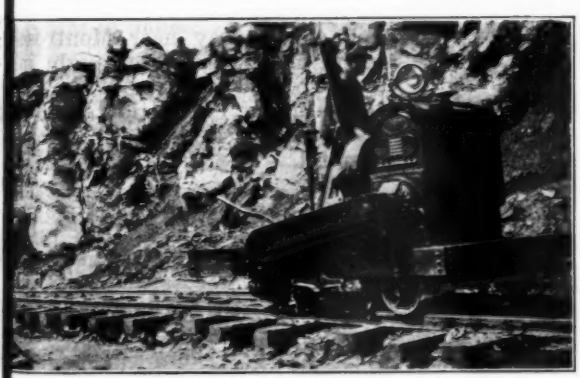


Shifting Track in the Quarry

Whether it is in the quarry, or on the waste dump where the overburden is disposed of, this machine and a few laborers will do all the required shifting and raising of track.

No large track gang need be maintained. Other operations need not be delayed waiting for track to be moved, or men taken from regular duties to work on track. Modernize your track raising and shifting operations with the Track Machine. It will save time and labor expense.

Made for Standard and Narrow Gauge Track.

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED
TRACK SHIFTER

He saw the point•

and Cordeau gave him an extra profit

A highway job near Wilkes Barre, Pa., required a side cut 400 yards long, containing 11,760 cu. yds. of rock. Ground sloped to the west, and the problem was to load and fire the shot so as to remove as much material as possible in this direction, and avoid handling.

Drilling was continued until a total of 1,186 holes had been made: 121 6" well drill holes, 469 2½" wagon drill holes, and 596 jackhammer holes. 23,750 lbs. of powder was used, and the hook-up required 15,000 feet of Cordeau-Bickford Detonating Fuse.

A perfect shot was obtained. Approximately 5,000 cu. yds. of rock was lifted clear of the right-of-way and deposited over the lower slope. This fact in itself was a big saving, justifying the use of Cordeau. In addition, however, was the fact that the shovels, air compressors, drilling equipment, pipe lines, tractors, etc., which under the old plan of three blasts would have had to be removed *three* times, were able to remain in place until the one giant blast was ready.

Frankly, only with Cordeau-Bickford Detonating Fuse would a giant blast such as this be practicable. The savings—the *extra* profit—were therefore due to the use of Cordeau. The Ensign-Bickford Company, Simsbury, Conn.

A new technique in blasting — free to executives.

CB 25

CORDEAU
DETONATING FUSE
BICKFORD

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

Gasoline Shovel Proves Ideal Loader in Logging Camp

AT THE Alturus, California camp of the Shaw-Bertram Lumber Company, where the operations are in W. R. Pickering Lumber Company timber, a Bucyrus-Erie 1030 gasoline shovel is used as a loader in getting out approximately 125,000 feet per day.

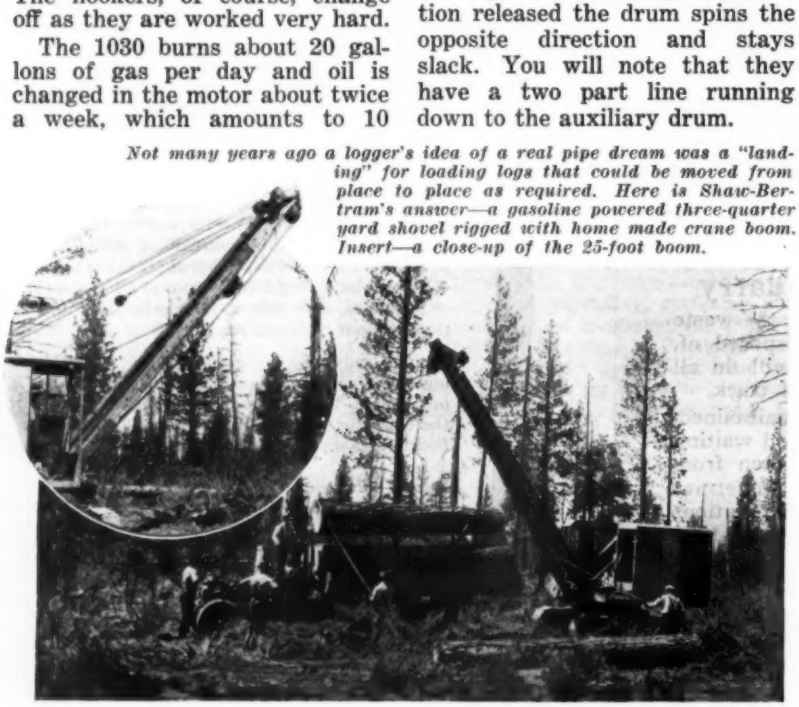
They are hauling from the machine, which is shown in the accompanying illustration, with seven or eight trucks a distance of from five to eight miles. Roads are swamped out for the loader-shovel and the logs delivered to the machine by crawler tractors where they are picked up and loaded onto the trucks. Sometimes one tractor is used and other times two to three, or possibly four, depending on the stand of timber and the distance of haul. Ordinarily they skid into the loading piles on the ground a distance of 150 to 200 feet on each side of the machine, although at times they will drag logs in 500 or even 1000 feet. They are working 10 hours a day and if sufficient logs are brought along side of the machine they could load as high as 200,000 feet per day. They are using an engineer on the machine, a top loader on the truck and four hookers. The hookers, of course, change off as they are worked very hard.

The 1030 burns about 20 gallons of gas per day and oil is changed in the motor about twice a week, which amounts to 10 quarts at each change. They are using Shell Ten No. 50. They do not add any oil. The machine goes along the road and stops every 100, 200 or 300 feet where the logs are brought in and decked by the tractor. The maximum log is approximately 2500 feet and the logs average about 200 feet, log scale. The trucks average about 3000 to 3200 feet per load.

The 25-foot loading boom, which is "home made," is handling the work it was intended to do very successfully although those in charge of the machine believe a boom five or seven feet longer would be better. It is made of 8x8 timbers and well armoured with plate 5/8-inch thick.

For a slack puller, a five-inch pipe has been installed on the left stick of the boom. (See inset.) In this pipe are nine Westinghouse No. 1090 car springs of 4 7/8 inches in diameter. The line runs through the springs and is fastened with a bolt through a plate at the bottom end of the last spring. When the load is hoisted the line from the auxiliary drum is wound up on the drum and the car springs compressed. When the log is unloaded and the friction released the drum spins the opposite direction and stays slack. You will note that they have a two part line running down to the auxiliary drum.

Not many years ago a logger's idea of a real pipe dream was a "landing" for loading logs that could be moved from place to place as required. Here is Shaw-Bertram's answer—a gasoline powered three-quarter yard shovel rigged with home made crane boom. Insert—a close-up of the 25-foot boom.



After the Flood . . .

The above illustrations show conditions at Montrose after the recent flood in which 49 dead have been recovered and others are still missing. The upper view shows a Bucyrus-Erie Gas+Air clearing muck from the streets of Montrose and the lower view shows a crew at work on a section of highway near Montrose where many cars were caught in the torrent. The driver of the car shown in the illustration escaped but at this writing is still at the hospital.

Landscaping Westchester Highways

(Continued from Page 73)

chased, is shown smoothing down the slope left by the contractor along an approach to the main Parkway. It has had such good care it shows few signs of old age, although in use for over eight years. Jack McGrath, who operates another dragline, broke in firing on a Bucyrus 1-B for the county years ago. This machine is dressing down a slope where an overpass on the main parkway intersects a state highway from Ossining.

Parkway system essentially self-supporting

The financial side of the program of the Westchester County

Parkway Commission has received careful consideration. While they can recommend acquisition of land, and construction of units of the parkway system, the Board of Supervisors has the power of appropriating funds for the work. Including a $10,000,000 grant from the State, a total of

Jack McGrath at the levers of this D-2 not only is making a nice curve for the bank, but loading the dirt he cuts off into the dump truck. The truck has about 50 yards haul to a shallow fill where the dirt will be spread by hand.

$73,600,000 has been expended since 1922.

Revenues are derived from rental of buildings and grounds, and from amusements and concessions. This income during 1929 and 1930 was large enough to cover all maintenance and operation expense, except capital debt charges. As for these, from 1922 to 1932 the assessed valuation of the county increased from 800 million dollars to 1800 million. A carefully compiled survey indicates that probably half of the billion dollar increase has resulted from construction of the parkway system. Thus without an increase in rate, the rise in real estate values permits the collection of increased taxes which more than offset the investment in parkways. These parkways have made Westchester County more accessible to New York City, and at the same time a more desirable place to live.

William L. Ward had been a leader in Westchester County for many years prior to his death in the summer of 1933. To him must be given credit for conceiving the parkway system. Actual carrying out of the construction program is due to the initiative of Jay Downer, Chief Engineer, who was Chief Engineer of the Bronx River Parkway Commission until this project was completed in 1925. He has had charge of engineering work for the Westchester County Park Commission ever since its inception.

Old Times & Old Timers

(Continued from Page 83)

feet of sand from the gravel but seemed to be getting nowhere with it. I didn't feel that the shovel was a success so would not go to work and the gravel company never accepted the shovel. It was, as we used to say, 'shot gun control' meaning that it used cylinder control just as the old Victor shovel did. The shot gun swing was efficient but the shot gun hoist on the Kilgore would not do the job. Power was spent quickly with no results as this machine would not dig the six foot of sand without hanging in the bank. I can't understand how one ever got as far from the factory as the one that landed down in Mexico which old timer J. F. Sullivan told about. My understanding is that there were only five of these machines built."

Thanks, Old Timer Sears! Can any of the old timers tell us about other "freak" machines?

And Old Timer Roberts Also Meets an Old Friend

FROM Dungamon, Virginia, Old Timer C. E. Roberts writes about Old Timer Jackson's story of "Old Sammy."

"I was very much interested in the picture of 'Old Sammy' and letter by C. G. Jackson. I am acquainted with Mr. Jackson, also the crew he said he was operating at this time. If I'm not mistaken, I was also craneman on this same shovel for an iron company at Jenifer, Alabama. I know it was the same type. The craneman handled the dipper by foot brake-hand lever combination. The swinging engine was suspended to the top of the cab in the rear of the operator, and the craneman stood down in the circle at the top of the masthead. Oscar 'Rabbit' Austin was the operator. Later I was 'boom-cat' on another Vulcan of the same type with the exception that it had a steam engine for the crowd.

"My brother, Jess Roberts, was operator on this job. It was for a cement company at Portland, Georgia.

"I was also on an old type 'A' Barnhardt Marion for the Alabama Coal & Iron Company at Ironaton, Alabama. This was about the first shovel that the Marion Company ever sent to Alabama. Bruce Morrison was operator.

"I enjoy reading these letters from the old timers, for I read about many I have known."

Glad to hear from you, Old Timer, and good luck to you.

The Bargain of the Year

ONE COMPLETE NARROW GAUGE DIRT MOVING OUTFIT including shovel, camps, shop and haulage equipment. Located near Fort Wayne, Indiana. Can you use it?

54 Steel bunks with mattresses and bedding. Mattresses and bedding are sewed up in burlap.
6 Heating stoves.
50 Shovels and picks, approximate.
5 Wagons and boxes. Light wagons about 2¾ axles.
1 Fairbanks Morse gasoline engine and 5x5 bulldozer pump 8 HP.
2 Fairbanks Morse gasoline engine and 3x5 bulldozer pump 1½ HP.
4 Track jacks, 15 ton.
3 Track jacks light.
1 Duplex Pump—Worthington, 5¼x 3-½x5.
10 Slips.
1 Anvil.
1 Forge.
6 Switches.
4 Frogs.
10 Switch points.
2 Wheelbarrows.
2 Each, scythes, hand saws, cant hooks, spike mails.
1 Carbide light.
1 Kitchen outfit.
1 Set boiler tubes for steam shovel.
30 Western dump cars, 5-yard.
2 Davenport locomotives, No. 2039 and No. 2040, weight about 20 tons.
1 36x84" vertical boiler.
1 6" centrifugal pump with upright engine attached.
2 Galvanized water tanks, wagon size.
100 Timbers, 10x12x16'.
12 Timbers 10x12x32'.
1 Chevrolet touring car, 1924 model.
1 Ford 1-ton truck.
1 Best Caterpillar tractor (30).
About 800 pieces of pipe, size 1½ and 2", random lengths.

Will consider individual sale of separate items.

Address Box 449 ME.
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★ ★ ★ **THE ITEMS LISTED on these pages have been selected because they offer unusual values to the man who is looking for a bargain. Some of this equipment is surplus stock which has never been used, some is rebuilt and carries new equipment guarantee, some is just plain used. But every item is priced for quick sale. If any of this equipment fits your needs send a postcard or letter, mentioning the reference number, to *Bargain Counter, Excavating Engineer, South Milwaukee, Wisconsin.* We'll pass your inquiry along to the owner and you will receive price and complete information promptly. Act now — with advancing prices on new stock this equipment will move fast.**

SHOVELS-CRANES DRAGLINES

P&H MODEL 208—45' BOOM DRAGLINE Cats—15½' long, 9' wide, 22" Treads. 100 HP. Waukesha High Alt. Engine. SCD-1.

AMERICAN 1 CU. YD. GASOLINE SHOVEL. Motor overhauled 1932. Good value. SCD-3.

P&H MODEL 600—40' BOOM CLAMSHELL. Waukesha 75 HP. Engine. New 1929. Dragline and Shovel equipment also available. SCD-4.

P&H MODEL 600. New 1929. 20' Boom. 14'3" Dipper Handle, 1 cu. yd. Dipper. Waukesha 75 HP. Engine. Dragline and Clam Shell Equipment also available. SCD-7.

BUCYRUS-ERIE MODEL 30-B DIESEL—25'9" Boom, 14' Dipper Handle, 1 yd. Dipper. SCD-9.

INDUSTRIAL BROWNHOIST—Model "H" 8-wheel Standard Gauge—50,000 lbs. capacity—50' Boom Steam Locomotive Crane. Good operating condition. SCD-18

MONIGHAN MODEL 1-W, WALKER — 60' Boom Dragline, 1¼ cu. yd. Page Bucket. Good condition. SCD-13.

P&H MODEL 600—40' BOOM DRAGLINE. Waukesha 75 HP. Engine. New 1929. Shovel and Clamshell Equipment also available. SCD-14.

KOEHRING MODEL 1—30' Boom Gasoline Crane. Cat Mounted — No Bucket—4½"x5" Wisconsin Engine. SCD-19

BUCYRUS-ERIE SLIGHTLY USED-LOAD-MASTER TRACTOR CRANE—14' Boom—Rubber tired wheels—Rated lifting capacity 4500 lbs. McCormick-Deering Power Unit—New Machine Guarantee. SCD-17

COMPLETE FRONT END EQUIPMENT

Shovel Equipment

¾ CU. YD. DIPPER—23' BOOM—15' DIPPER HANDLE—Extra High Lift Rope Crowd Shovel Equipment suitable for Models 1030 or 1035. Brand New. SE-2.

¾ CU. YD. DIPPER—23' BOOM and ENGINE—12'6" DIPPER HANDLE—Shovel Equipment suitable for 20-B Steam. Brand New. SE-15.

¾ CU. YD. DIPPER—26' BOOM and ENGINE—17' DIPPER HANDLE—High Lift Shovel Equipment suitable for 30-B Steam. Brand New. SE-16.

¾ CU. YD. DIPPER—25'9" BOOM—14' DIPPER HANDLE—Shovel Equipment suitable for 30-B Diesel. Brand New. SE-17.

⅞ CU. YD. DIPPER—23' BOOM—15' DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment Complete suitable for Model 1030 or 1035. Rebuilt—New Equipment Guarantee. SE-22.

⅞ CU. YD. DIPPER—21'9" BOOM and ENGINE—15' DIPPER HANDLE — High Lift Shovel Equipment. Suitable for 31-B Steam. Brand New. SE-18.

1 CU. YD. DIPPER—20' BOOM—15' DIPPER HANDLE—Rope Crowd Shovel Equipment, suitable for Osgood "Conqueror". Good mechanical condition. Low Price. SE-24

1 CU. YD. DIPPER—24' BOOM—18' DIPPER HANDLE—Slightly used but good conditioned. Suitable for any Bucyrus-Erie GA-2 or GA-3 Machine. SE-25.

1 CU. YD. DIPPER—24' BOOM—16' DIPPER HANDLE—Rebuilt and Guaranteed. Suitable for application Bucyrus-Erie GA2 or GA3 Machines. SE-26

1¼ CU. YD. DIPPER—22'6" BOOM—16' DIPPER HANDLE — Rebuilt and Guaranteed. Suitable for application Bucyrus-Erie GA2 or GA3 Machines. SE-27

1¼ CU. YD. DIPPER—25' BOOM—17' DIPPER HANDLE—Slightly Used Rope Crowd High Lift Shovel Equipment suitable for Model 37-B. New Machine Guarantee. SE-5.

1½ CU. YD. DIPPER—23'6" BOOM—15' DIPPER HANDLE—Slightly Used Rope Crowd Shovel Equipment suitable for Model 37-B. New Machine Guarantee. SE-6.

1½ CU. YD. DIPPER—27' BOOM—17' DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment suitable only for Bucyrus-Erie 43-B machines. Rebuilt—New Equipment Guarantee. SE-23.

Dragline Equipment

35' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-2.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-3.

40' BOX BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-4.

45' BOX BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-5.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. **Brand New.** DL-6.

45' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. **Brand New.** DL-7.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. **Brand New.** DL-8.

45' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. **Brand New.** DL-9.

BRAND NEW Ropes included with each of above Dragline Equipments.

All of above equipment is BRAND NEW and of BUCYRUS-ERIE manufacture.

Clamshell Equipment

40' BOX BOOM CLAMSHELL EQUIPMENT INCLUDING ROPES. Suitable for Model D-2. Brand New. CS-8.

Trench Digging Equipment

¾ CU. YD—36" WIDE SOLID TYPE DIPPER, 21' Boom, and all auxiliary equipment for application to Model 1030. Will dig to maximum depth of 18'. DS-3.

BRAND NEW PAGE, two dippers each ¾ cu. yd., one 38" wide over cutters, the other 49½" wide over cutters. 17'1½" Boom and all necessary auxiliary equipment. Will fit Bucyrus-Erie 1030 or 1035. DS-7.

BRAND NEW Ropes included with each of above Trench Digging Equipments.

DIPPERS

Small Machines

2 ¾ CU. YD.—Plate.—Will fit 20-B Steam or Gas. Brand New. D-12

1 2/3 CU. YD.—Plate front.—Will fit 14-B. Brand New. D-13

1 ¾ CU. YD.—Rock type.—Will fit 30-B Gas or Diesel. Brand New. D-14

1 ¾ CU. YD.—Rock Type.—Will fit 20-B Steam or Gas. Brand New. D-15

4 ¾ CU. YD.—Plate front.—Will fit 1030 or 1035. Brand New. D-16

1 ¾ CU. YD.—Cast Front Inserted Tooth. Will fit 1030 or 1035. Brand New. D-17

2 ⅞ CU. YD.—Plate front.—Will fit 1030 or 1035. Brand New. D-18

1 ⅞ CU. YD.—Plate Front. Will fit 18-B. Brand New. D-20

1 ⅞ CU. YD.—Rock type. Will fit 31-B. Brand New. D-21

1 1 CU. YD.—Rock type. Will fit D-2 or 31-B. Slightly Used. D-22

2 1 CU. YD.—Cast Front Inserted Tooth Dippers. Rebuilt and Guaranteed. Suitable for application GA2 or GA3 Machines. D-34

1 1¼ CU. YD. INSERTED TOOTH. Will fit GA-2 or GA-3. Slightly Used. D-25.

1 1¼ CU. YD.—Cast Front Inserted Tooth Dipper. Rebuilt and Guaranteed. Suitable for application GA2 or GA3 Machines. D-35

1 1¼ CU. YD.—Plate front. Will fit E-2, 41B or 42-B. Slightly Used. D-26

2 1¼ CU. YD.—PLATE FRONT. Will fit E-2. Brand New. D-27.

1 1½ CU. YD.—PLATE. Will fit E-2. Brand New. D-28.

2 1½ CU. YD.—Manganese Front Inserted Tooth. Will fit E-2, 41-B or 42-B. Slightly Used. D-29

1 1½ CU. YD.—Vanderhoef type with Vanderhoef teeth. Will fit E-2 or 42-B. Slightly Used. D-30

Large Machines

1 2½ CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on 68-C and 70-C machines. Brand New. D-1.

2 3 CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on Model 100-B, 68-C, 70-C Machines. Brand New. D-2.

1 3½ CU. YD.—Front 2¾" Nickel Chrome Steel, two part Van Port Reversible Teeth. Can be used on Model 88-C, 95-C, Class 180. Brand New. D-3.

1 4 CU. YD.—Front 2¾" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Has seen some service but in good condition. Can be used on Model 100-C, 120-B. D-4.

1 4½ CU. YD.—Lip 2¼" Manganese Steel, two part Reversible Manganese Teeth. Can be used on Model 88-C, 110-C. Brand New. D-5.

3 6 CU. YD. Molybdenum Steel Front, Annealed Cast Steel Back, two part Reversible Van Port Teeth. Can be used on 225-B and 320-B. Brand New. D-11.

1 8 CU. YD.—Front Molybdenum Steel, two part Van Port Reversible Teeth. Can be used on Model 320-B. Slightly Used but excellent condition. D-6.

DRAGLINE BUCKETS

BRAND NEW

2 ¾ CU. YD. PAGE CLASS "C." Approximate weight each 2425 lbs. DB-1

2 1 CU. YD. PAGE CLASS "C." Approximate weight each 3460 lbs. DB-2

1 1½ CU. YD. PAGE CLASS "C." Approximate weight 4540 lbs. DB-3

3 2 CU. YD. PAGE CLASS "C." Approximate weight each 5630 lbs. DB-4

1 2 CU. YD. OMAHA STANDARD. Approximate weight 4300 lbs. DB-5

REBUILT

1 1¾ CU. YD. OMAHA STANDARD. Approximate weight 3800 lbs. DB-7

1 2 CU. YD. BUCYRUS-ERIE TYPE "U" RED ARCH. Approximate weight 3700 lbs. DB-8

1 2½ CU. YD. BUCYRUS-ERIE INSERTED TOOTH. Approximate weight 6500 lbs. DB-9

1 2½ CU. YD. OMAHA STANDARD. Approximate weight 5400 pounds. DB-10

BOILERS

BRAND NEW

Will Make That Old Shovel Work Like New.
Can Also Be Used for Miscellaneous Service.

Vertical Type

9 36"x82½"—26 H.P.—142 lb. Working Pressure. Mass. Std. Will fit Type A. B-1.

4 42"x88"—35 H.P.—144 lb. Working Pressure. Mass. Std. Will fit Type B Shovel. B-2.

1 44½"x88½" fitted with extended fire box for burning wood. Can be used for coal or coke. 37 H.P.—144 lb. Working Pressure. ASME Std. Can be installed on Type B Shovel. B-3.

1 44½"x88½".—37 H.P.—145 lb. Working Pressure. Canadian Std. Will fit Type B Machine. B-4.

1 46½"x88½"—37 H.P. 150 lb. Working Pressure. Special Wood Burning. Mass. Std. Will fit any B-2 or B-3 Machine. B-7.

2 46½"x88½"—37 H.P.—150 lb. Working Pressure. Mass. Std. Will fit B-2 or B-3 B-8.

3 46½"x110"—40 H.P.—155 lb. Working Pressure. Special Wood Burning Fire Box. ASME Std. Will fit any B-2 or B-3 B-9.

1 54"x100"—41 H.P.—125 lb. Working Pressure. ASME Std. Will fit B-2 or B-3. B-11.

1 58"x7'9"—70 H.P.—150 lb. Working Pressure. Mass. Std. Will fit 42-B Machine. B-12.

Locomotive Type

3 44"x17'—75 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 68-C. B-13.

1 44"x18'—88 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 70-C B-14.

1 54"x9'7"—70 H.P.—125 lb. Working Pressure. Canadian Std. Will fit Model 50-B Machine. B-15.

2 54"x11'3"—92 H.P.—125 lb. Working Pressure. ASME and Mass. Std. Will fit Model 50-B Machine. B-16.

ELECTRICAL EQUIPMENT

MOTOR—GENERAL ELECTRIC—3 phase, 25 cycle, 550 volt, 1500 RPM., 90 HP., BRAND NEW. EE-1.

50 KW MOTOR-GENERATOR SET—GENERAL ELECTRIC—consisting of 3 phase, 60 cycle, 440 volt, 1170 RPM., 75 HP., Induction Motor connected to 50 KW, 250 volt, 1200 RPM., Generator, including suitable rheostat and compensator. BRAND NEW. EE-2.

COMPENSATOR—GENERAL ELECTRIC—75 HP., 2200 volt, 3 phase, 25 cycle, manual type. BRAND NEW. EE-3.

TRANSFORMER—GENERAL ELECTRIC — 5-KVA. 2200-3810 volt primary, 440-220 volt secondary—3 phase, 60 cycle, with cast iron tank and cover, including specially fastened bushings to prevent oil leakage. BRAND NEW. EE-4.

GENERATOR — WESTINGHOUSE — 125 KW, 250 volts, 500 amperes. Direct Current. 440 RPM. Includes two outboard bearings. BRAND NEW. EE-5.

MOTORS (2) — GENERAL ELECTRIC — 21.5 H.P. 3 phase, 60 cycle, 440 volt, 900 RPM. Totally enclosed—ball bearing. BRAND NEW. EE-6.

LIGHTING PLANTS

1 1 KW MOON TURBO STEAM GENERATOR for Lighting Plant. 32 Volt. New. LP-1.

1 1 KW MOON TURBO STEAM GENERATOR for Lighting Plant. 110 Volt. Used. LP-3.

1 1½ KW MOON TURBO STEAM GENERATOR—110 Volt Light Plant. Slightly Used. LP-5.

AIR COMPRESSORS

1 BRAND NEW WORTHINGTON—METAL-WELD—2-cylinder 7"x6" Vertical 162 cu. ft. piston displacement, Air Compressor. Fitted with Laidlaw feather valves — Lugs on side for mounting on skids or channels—Shaft extended and equipped with semi-flexible coupling to take 2⅝" drive shaft—Force feed lubrication. Automatic control. Includes 1" High capacity centrifugal circulating pump—"V" belt driven—18"x41" Air Receiver, 100 pounds working pressure, A.S.M.E. Standard. Electric or gasoline power required approximately 30 H.P., approximately 1000 R.P.M.—Compressor Speed approximately 550 R.P.M.—Overall dimensions:—Height 45"—Length 37½"—width 28". AC-3.

2 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Brand New. AC-1.

2 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Used. Make offer. AC-2.

ENGINES

Designed especially for application to Excavating or similar Equipment. Can be used for stationary or semi-stationary service.

Diesel

2 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—4 cylinder, 7" bore x 8½" stroke, 75 HP at 600 RPM, 4 cycle, Vertical—valve in head type. Includes radiator, fan and air cleaners. DE-1.

2 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—5-cylinder, 9" bore x 10½" stroke, 150 HP at 450 RPM, 4 cycle, Vertical—valve in head type. Dust proof, Oil tight crank case and forced lubricating system. Full equipment. Also auxiliary air starting equipment. DE-2.

4 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—3-cylinder 6" bore x 8" stroke, 45 H.P. at 650 R.P.M., 4 cycle, Vertical—valve-in-head type. Includes radiator, fan and air cleaners. DE-5.

3 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—4-cylinder, 6" bore x 8" stroke, 60 HP. at 650 RPM. DE-6

Steam

1 12½"x16" link reversing type for Railroad Shovel. ME-1.

2 4½"x5" reversible—20.8 HP at 400 RPM. 100 lb. Pressure. ME-2.

1 4¾"x5" reversible—23.2 HP at 400 RPM. 100 lb. Pressure. ME-3.

2 5"x5" reversible —25.6 HP at 400 RPM. 100 lb. Pressure. ME-4.

1 "LITTLE TUGGER" INGERSOLL RAND STEAM HOIST ENGINE No. 1-H-5-2½ H.P. ME-5.

PUMPS

1 NB—3 STAGE CENTRIFUGAL PUMP—2" suction and discharge — bronze impeller and shaft—capacity 100 gallons per minute at 240' head operating at 1720 RPM or 270' head at 1780 RPM. Now equipped for belt drive but can be operated by 15 HP Electric Motor. ME-6.

Not in the Contract

"How did you get on in your law suit for compensation against the man whose dog bit you?

"He had a clever lawyer who proved that I bit the dog."

"Pa, what does it mean here by 'Diplomatic Phraseology?'"

"My son, if you tell a girl that time stands still while you gaze into her eyes, that's diplomacy. But, if you tell her that her face would stop a clock, you're in for it."

A comely colored girl has just been baptized in the river. As she came to the surface she cried, "Bless de Lawd, Ise saved! Las' night I was in the ahms of Satan, but tonight Ah'm in de ahms of de Lawd!"

"Sistuh," came a baritone voice from the shore, "how is you all fixed up for tomorra ebening?"

Man is a worm of the dust. He appears on the earth for his brief moment, wiggles around awhile and then some chicken gets him.

A man with a little black bag knocked at the front door.

"Come in, sir, come in," said the father of fourteen children, "and I hope to goodness sake you're a piano tuner."

Mr. Gadget: "What is the most pathetic picture in the world?"

Ditto: "A horse fly sitting on a radiator cap."

Sandy and Annie took little Donald to the pictures. The attendant warned them that unless the child kept quiet they would have to leave and get their money back. Halfway through the principal film Sandy turned to Annie and whispered, "Vell, vot do you tink of it?"

"Rotten," replied Annie.

"Yes," answered Sandy. "Pinch de baby."

Kind Old Lady: "You should cheer up your little brother and make him stop crying."

Boy: "I'd like to see you try to cheer up anybody who's just eaten four bananas, three hot dogs, four ice cream cones and a bag of peanuts."

"Look here, boss," said a negro camp cook to an Alabama butcher, "dat ham you sold me last night was spoiled."

"Impossible," said the butcher, "it was cured in the best way."

"Well, boss, if dat ham was cured, it sho' had a powerful relapse."

Visitor: "Well, Joe, how do you like your new little sister?"

Joe: "Oh, she's all right, I guess; but there are lots of things we needed worse."

"My sister is engaged to a widower with four children who plays the violin. Can you imagine anything worse?"

"Yes, six children and a saxophone."

"So your name is Johnny Thompson," the teacher said, to make sure of the facts, "but your mother's name is Jones?"

"Yes, ma'am," Johnny said, "You see she married again, and I didn't."

"You remember when you cured my rheumatism a couple of years ago, Doc?" asked the patient, "and you told me I should avoid dampness?"

"Yes, that's right," replied the doctor, approvingly.

"Well, I've come to ask you if I can take a bath."

FOR SALE

Crushing and Sizing Plant

NEW • MODERN • COMPLETE
ALL-STEEL

Capacity, 225 tons per hour. Suitable for crushed stone, slag, sand and gravel, or for crushing and screening other material. New machinery, driven by independent motors, 3-phase, 440-volt, 60-cycle push button remote control. Attractive price, liberal terms.

THE DETROIT SLAG AND DOCK CO.

845 Hanna Building Cleveland

POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

DRAGLINE-SHOVEL OPERATOR

10 years' experience on Bucyrus-Erie, Link Belt, Marion and Northwest machines, steam, gasoline and Diesel powered. Have worked on highway and railroad grading, quarry excavation and drainage irrigation. Willing to go anywhere in U. S. A. Also have 2 years' machine shop experience. Can do own repairing and furnish A-1 references. Present location Florida. Box 5702.

SHOVEL OPERATOR

Ten years' experience on Steam, Gas+Air and Electric Shovels on road and quarry work. Can do own repairing and furnish excellent references. Married. Present location Virginia. Box 6100.

EXPERT DRAGLINE AND SHOVEL OPERATOR

16 years' experience as shovel operator. Married, 36 years of age. Have operated practically all makes of machines, and have 10 years' experience as dragline operator. Can handle steam, Diesel, electric or gasoline machine. Have worked on highway and railroad grading, rock excavation in quarry, drainage and irrigation and dredging and also gold dredging. Prefer position on Bucyrus-Erie E-2, D-2, or 50-B or other Bucyrus-Erie machines. Have also operated Class 220 and 225 electric and Diesel electric machines. Capable of taking charge of repairing and erecting and can handle crews. Best of references and can do own repairing. At present located in California, but will go anywhere. Box 5507.

ENGINEER-SUPERINTENDENT WANTS CONNECTION WITH CONTRACTOR

Twenty years' exceptional experience in factory construction, rock work, roads, dams, tunnels, hydro-electric developments, foundations. Has produced results under difficult conditions and can handle large program in whole or part. Eight years Latin America. Go anywhere. Box 5102.

SUPERINTENDENT

20 years operating and in charge of heavy strip mine and quarry equipment. 45 years of age. Can furnish references from any former employer and the largest manufacturer of excavating equipment in America. Can take full charge on reasonable notice. Box 5901

OPERATOR-QUARRY FOREMAN

Have 25 years experience operating steam, electric and gasoline shovels and draglines on all classes of work. Can do own repair work. Also experienced quarry foreman with very best references. Married but willing to go anywhere. Present location Kentucky. Box 6200.

EXPERIENCED DRAGLINE OPERATOR

Fifteen years' experience on Bucyrus-Monighan, P&H, Northwest and other makes of Steam, Diesel, gas and electric draglines on levee work and phosphate mines. Hold three sets civil service papers with ratings of 70%, 85%, and 100%. Married but can go anywhere. Furnish excellent references. Present location, Louisiana. Box 5903

DRAGLINE-SHOVEL OPERATOR

Have 18 years' experience on drainage and highway work. Will go anywhere in U. S. A. Married. Can do own repair work and furnish reliable references. Present location, Florida. Box 5302.

SHOVEL OPERATOR

14 years' experience on railroad, highway and coal stripping. Prefer big coal stripper. Can do own erecting and repairing. Willing to go anywhere on short notice. Can furnish best of references. Present location Alabama. Box 6300

OPERATOR

Nine years' experience on Bucyrus-Erie 37-B, 50-B and E-2 Diesel and gasoline powered. Also on Northwest and P&H machines. Can do own repair work and handle any class of work. References. Box 6301

DRAGLINE OPERATOR

13 years' experience operating steam, gasoline and Diesel draglines and clamshells on levee and drainag projects. Can do own repair work and furnish A-1 references. Single and willing to go anywhere. Present location Iowa. Box 6302

TRANSITMAN—OFFICE WORK

Experienced transitman with mining experience desires transit work, or will work as rodman, chainman or engineer's helper. Have also had experience as timekeeper, and much experience in safety work. Good references. Located Wisconsin, will go anywhere. Box 3513.

Equipment You Ought to Know About

(Continued from Page 87)

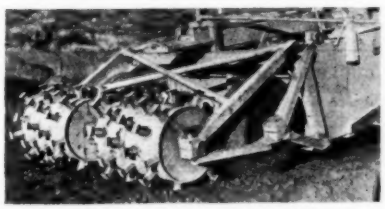
by a moving cutter bar similar to that of a mower. An initial compression of the pavement is secured by the beveling of the underside of the cutter bar teeth. The machine lays pavement of any width and any thickness. It requires no forms, needs no preparation of shoulders, and will lay pavement right up to the road edge.

The manufacturers claim that it has been used on practically every type of black top pavement, both hot and cold, and has demonstrated its ability to handle stiff mixes that have been standing and become lumpy, using lumps and all. The peculiar action of the cutter bar strike-off makes it possible to lay an accurate abutting joint in laying parallel courses or in laying up to line of curb without raking or hand work.

Combined Scraper and Sheepsfoot Roller

A UNIQUE hookup of scraper and sheepsfoot roller which is proving very effective on contracting jobs at the present time has been announced recently by *R. G. LeTourneau, Inc., Stockton, California.* It tamps and compacts fills automatically.

The scraper-roller was developed for use on fills where extreme compaction is required, or where elimination of a separate sheepsfoot roller is desired. In operation it is mounted rigidly behind the rear wheels of the scraper in such a manner as to be clear of the ground when the scraper is being loaded or when it is carrying its load. When it arrives on the fill and the scraper blade is raised for dumping, the roller takes the load off the rear



wheels and begins its tamping work. Because the dumping is always done in this position, the roller is in action as long as the scraper is on the fill. As the scraper leaves the fill, its blade is lowered and the weight of the roller is again carried on the rubber-tired wheels. This arrangement is proving especially valuable for fast, extremely solid tamping because the entire weight of scraper and load is utilized during the operation.

INDEX
FOR VOLUME XXVII
January to December, 1933, inclusive
NOW READY
SENT FREE ON REQUEST
EXCAVATING ENGINEER
South Milwaukee, Wisconsin

"What kind of a dog you got there?" asked the timekeeper of the little boy who was leading a disreputable pup by a piece of clothesline.

"This is a police dog," the boy said.

"Hm!" mused the timekeeper, taking another look at the mongrel; "he doesn't look much like a police dog to me."

"Maybe not, Mister," the boy replied; "But that's because he's in the secret service."

FOR SALE

RATES:	First insertion rate per column inch	Repeat insertions (no change in copy) rate per column inch
Up to 3 inches	$4.50	$4.00
Over 3 and up to 7 inches	4.25	3.75
Over 7 inches	4.00	3.50

Rates are net (no commissions, no discounts) and payable in advance of publication. Send your remittance with insertion order and copy.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards

BUCYRUS ERIE So. Milwaukee, Wis.

OFFERS FOR SALE OR RENT
FACTORY REBUILT and USED SHOVELS--CRANES--DRAGLINES

Please send me full details on:

- ☐ Osgood 1½ yd. Steam Shovel — Bargain.
- ☐ Lorain 75-B 1¼ yd. Shovel.
- ☐ P & H 600 1-yd. Shovel-Dragline.
- ☐ Industrial—Brown Hoist—8 Wheel 50' Boom Steam Crane.
- ☐ Bucyrus-Erie 41-B steam 1¼-yd. Shovel. Good condition. Very low price.
- ☐ Monighan Dragline 60-foot boom. Priced right.

Name .....

Address .....

P. & H. MODEL 206 Gasoline Combination Shovel and Clamshell machine. Good condition. Located vicinity Chicago. Box 336-SS.

20-B BUCYRUS-ERIE STEAM SHOVEL, serial number 4000; caterpillar mounted; 18-foot boom, 12-foot 6-inch dipper handle, 1-yard dipper; shipped new in 1923; located western Missouri. Bargain. Box 241-SS.

Marion Type 32 Steam Shovel, Shop No. 5676, 18' boom, 15' dipper handle, 1¼ cu. yd. dipper, shipped May, 1926, good operating condition. Box 451SS.

CHEAP!

Two 20-B Bucyrus steam shovels. Located Aurora, Illinois. Price each $1500.

30-B Bucyrus steam shovel. Located Charleston, Mississippi. Price $1500. Box 303-SS.

MARION MODEL 32, shop No. 5459, mounted on "cats," steam-powered, 1¼-cubic-yard dipper, 24-foot boom, 17-foot 6-inch dipper handles. Box 82-SS.

BUCYRUS-ERIE TYPE "GA-2" GAS+AIR SHOVEL, shop number 4117, mounted on spur gear drive caterpillar trucks, and equipped with a 24-foot boom; 18-foot, 4-inch dipper handle; 1-cubic-yard manganese cast front socket inserted tooth dipper; power boom hoist; air self-starter, and all equipment and appurtenances in accordance with the specifications of Bucyrus-Erie Company, f.o.b. cars shipping point Virginia. Box 126-SS.

ONE TYPE "B" BUCYRUS-ERIE STEAM MACHINE, mounted on "cats", ¾-cubic-yard dipper, shop number 2301, 19-foot boom and 16-foot dipper handle. Box 33-SS.

BRAND NEW PAGE DRAG SHOVEL EQUIPMENT suitable for application to Bucyrus-Erie 1030, 1035, or 32-B machines now in the field, consisting of 17-foot 1½-inch boom, 11-foot dipper handle, and two ¾ cubic-yard dippers; one 38-inches wide over cutters—the other 49½-inches wide over cutters, together with auxiliary A frame and ropes. Priced below cost. Box 381-SS.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards
Continued

USED P&H MODEL 700 gasoline, combination shovel-dragline, shop number 3007, including 1¼-cubic-yard drag scraper bucket. Dragline boom 40-foot plus 10-foot extension, shovel boom 25-foot 10-inches, dipper handle 19-foot 3-inches, dipper 1¼-cubic-yard. Engine Waukesha Type WL 4 cylinder 6¼"x7". Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SS.

LORAIN 75-B Shop No. approximately 5000—21' Boom. 18' Dipper Handle, 1¼ cubic yard all cast Dipper, automatic Dipper Trip, Standard center drive Cat, Power Boom Hoist, four cylinder Waukesha 6¼"x8" Gas Engine. New July, 1930. Located Strawn, Texas. Excellent mechanical condition. Box 441SS.

50-B STEAM BUCYRUS-ERIE
COMBINATION SHOVEL AND DRAGLINE

- 26' Boom
- 17' Dipper Handle
- 2 yard Dipper
- 50' Boom Dragline Equipment
- 1½ cubic yard Page Bucket
- 1 KW 32 Volt Moon Electric Light Plant
- Boiler—Standard coal burning locomotive type 54"x9'7"

INCLUDING

2 steel under-frame flat cars on which machine now loaded. New 1929. Moved only 200,000 yards material. Excellent condition. Deal direct with owner.

PRICE VERY ATTRACTIVE

Box No. 465 LSD

BUCYRUS-ERIE TYPE B High Lift Steam Shovel, Power Boom Hoist. Good condition. Box 425SS.

BUCYRUS-ERIE SLIGHTLY USED ½-CUBIC YARD Rope crowd gasoline shovel. Will demonstrate. Box 282-SS.

REBUILT GA-2 BUCYRUS-ERIE SHOVEL mounted on single shaft caterpillar, 1¼-cubic yard inserted tooth dipper, 22-foot 6-inch boom, 16 foot dipper handle, starter. Carries guarantee of new machine. Box 43-SS

BUCYRUS-ERIE 20-B steam shovel ¾-yard Dipper. $600.00. Chicago territory. Box 348-SS.

TWO TYPE B BUCYRUS-ERIE STEAM SHOVELS. Good operating condition. $1000 each. Box 328-SS.

ONE 18-B BUCYRUS-ERIE, ⅞-yard dipper on full revolving caterpillars. Box 182-SS.

BUCYRUS-ERIE-GAS-AIR-SHOVEL—22' 6" Boom—16' Dipper Handle—1 cu. yd. Dipper—Single Shaft Cat. Located Canaan, N. Y. Good operating condition. Box 455 SS

NORTHWEST SHOVEL, model 105, caterpillar mounted, 24-foot boom, 1-cubic-yard dipper, 16-foot dipper handle. In good condition. Price $4,500, f. o. b. Utica, New York. Box 34-SS.

P&H MODEL 204. Shop number above 2200 combination Shovel Clamshell. 19' shovel boom, 14' 6" dipper handles, ½ cubic yard dipper, 35' clamshell boom, ½ cubic yard Owens Type M digger type bucket. Both front end equipments less than one year old. Excellent condition. Box 254-SS

BUCYRUS-ERIE MODEL 32B Gas Chain Crowd Shovel—21'6" Boom, 16' Dipper Handle, ⅞ yard Cast Front Inserted Tooth Dipper, Wisconsin, six-cylinder 5"x6" Engine. Excellent condition. Box 422SS.

BYERS BEARCAT, Model 27, gasoline ½-cubic-yard Skimmer scoop, crane-clamshell and drag shovel with front opening dipper. Engine—4-cylinder, 4"x5" Hercules Model OX. Machine new July 1928. Excellent condition. Box 293-SS.

TYPE B BUCYRUS-ERIE COMBINATION HIGH LIFT STEAM SHOVEL, 19-foot 8-inch boom, 16-foot dipper handle, ¾-cubic yard dipper, power boom hoist and 36-foot boom clamshell equipment complete. Located central Indiana. Price as is, f.o.b. present location $2,000. Box 311-SS.

BROWNING STEAM LOCOMOTIVE CRANE, 20 ton capacity, 50 foot boom.

BUCYRUS-ERIE GAS+AIR CRANE with 40-foot boom, ¾-yard Page Dragline bucket. Fairleads and shovel boom, no dipper stick. Machine No. 4347.

Box 373-SS.

BUCYRUS-ERIE 1030, ¾-cubic-yard rope crowd gasoline shovel. Factory rebuilt and guaranteed. Box 283-SS.

TYPE B-2 BUCYRUS-ERIE STEAM SHOVEL, number 9830, mounted on single shaft caterpillar type mounting. Equipped with 21-foot 3-inch boom, 16-foot dipper handle, ⅞-cubic-yard inserted tooth dipper. Boom hoist and Mass. standard boiler. Located vicinity of Boston. Reasonably priced. Box 345-SS.

BUCYRUS-ERIE GAS+AIR Combination high lift shovel and dragline equipment. Chain drive. "Cats." Very good condition. Located vicinity Chicago. Box 337-SS.

BUCYRUS-ERIE GA-2 High Lift Shovel—22'6" Boom, 16' Dipper Handle, 1¼ cubic yard Dipper, four cylinder 6¼"x8" Engine. Single Shaft Cat. Shop reconditioned. Bargain price. Box 426SS.

BUCYRUS-ERIE D-2 Diesel High Lift Shovel—26' Boom, 17' Dipper Handle, 1 cubic yard Dipper, Atlas four cylinder 6½"x8½" Engine. Excellent condition. Box 428SS.

AMERICAN Gas Shovel—21' Boom, 15' Dipper Handle, 1 cubic yard Dipper, Waukesha four cylinder 6"x7" Engine. Bargain price. Box 429SS.

BYERS BEARCAT Gas Shovel—16' Boom, 12' Dipper Handle, ⅜ yard Dipper, Hercules Gas Engine. Also 30' Boom Dragline Equipment. Good mechanical condition. Price right. Box 431SS.

P&H MODEL 208—45' Boom Dragline—100 HP Waukesha Gas High Altitude Engine. Good operating condition. Box 432SS.

P&H MODEL 207—40' Boom Dragline—Buda Gas Engine. Field reconditioned. Box 433SS.

P&H MODEL 600 Gas Shovel—20' Boom, 14'3" Dipper Handle, 1 cubic yard Dipper. Also 40' Boom Clamshell and Dragline Equipment available. 75 HP Waukesha Gas Engine. Bargain price. Box 434SS.

KOEHRING MODEL 1 Gas 30' Boom Crane—4½"x5" Wisconsin Engine. Box 435SS.

OSGOOD Steam Shovel—21'9" Boom, 16' Dipper Handle, 1½ cubic yard Dipper. Good operating condition. Box 436SS.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer
South Milwaukee, Wisconsin

HIGH LIFT TYPE B-2 steam shovel No. 3867 mounted on caterpillars and equipped with 19'9" boom, 16' dipper handle, ⅞ cu. yd. inserted tooth dipper, two speed, heavy counterweight, and boom hoist. Located in New York State (at or near Pine Bush). Would accept any reasonable offer. Box 448 SS.

TYPE GA-2 SHOVEL NO. 10937 mounted on single shaft caterpillar mounting and equipped with 24' boom, 16' dipper handle, 1¼ cu. yd. inserted tooth dipper, electric starter and boom hoist. Located in Massachusetts—now working. Can be purchased at very low price. Box 445 SS.

INDUSTRIAL BROWN-HOIST MODEL "H"—50' Boom Steam 8 Wheel Locomotive Crane—50,000 lb. capacity. Good operating condition. Located vicinity Chicago. Box 442SS.

P&H MODEL 600—1-yard Gasoline Shovel. Three years old. Excellent condition throughout. Just been thoroughly overhauled. Will sacrifice at bargain to responsible buyer. Located in Wisconsin. Box 363-SS.

BUCYRUS-ERIE 41-B STEAM SHOVEL—21 foot boom, 15 foot dipper handle, 1¼ cu. yd. dipper. Good operating condition. Box 406-SS

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The Excavating Engineer
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Small Draglines
Under 2 Yards

BUCYRUS-ERIE D-2—Atlas Diesel—45' boom dragline and 1 cu. yd. Page bucket. Cat mounted. Good operating condition. Located near Lake Providence, Louisiana. Very attractive price. Box 450-SD.

BUCYRUS-ERIE D-2 DIESEL—40' Boom Dragline, used on light work about 6 months since rebuilding. Excellent condition. Located Central Ohio. Box 443-SD.

BUCYRUS-ERIE—REBUILT 45-B Gas—65' Boom Dragline. LeRoi six cylinder 6½"x7" Gasoline Engine. 1½ KW Kohler Light Plant installed. New Machine Guarantee. Box 456-SD.

MONIGHAN 60 FOOT BOOM DRAGLINE mounted on 1-W walking device—Waukesha 5¾x8, 4 cyl. gas engine, also 1¼ yd. Page bucket. Good operating condition. Box 408-SD

P & H Model 206 B Dragline. Good operating condition. Very favorably priced. Box 390-SD.

BUCYRUS-ERIE GAS+AIR combination high lift dragline and shovel. Chain drive. "Cats." Excellent condition. Located vicinity Chicago. Box 337-SD.

BUCYRUS-ERIE E-2 DIESEL DRAGLINE, caterpillar mounted, 50-foot boom, 1¼-cubic-yard Omaha bucket, Kohler lighting plant. Machine was new in July 1930 and has been used less than 6 months. Box 248-SD.

P&H MODEL 700 USED GASOLINE COMBINATION DRAGLINE SHOVEL, shop number 3007, 40-foot dragline boom plus 10-foot extension and 1¼-cubic yard drag scraper bucket. 25-foot 10-inch shovel boom, 19-foot 3-inch handle and 1¼-cubic-yard dipper. Waukesha Type WL 4 cylinder 6¼"x8" engine. Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SD.

P&H MODEL 208—45' BOOM DRAGLINE—7¾"x9" four cylinder Twin City Gas Engine, 1¼ cu. yd. Omaha Bucket included. Box 460-SD.